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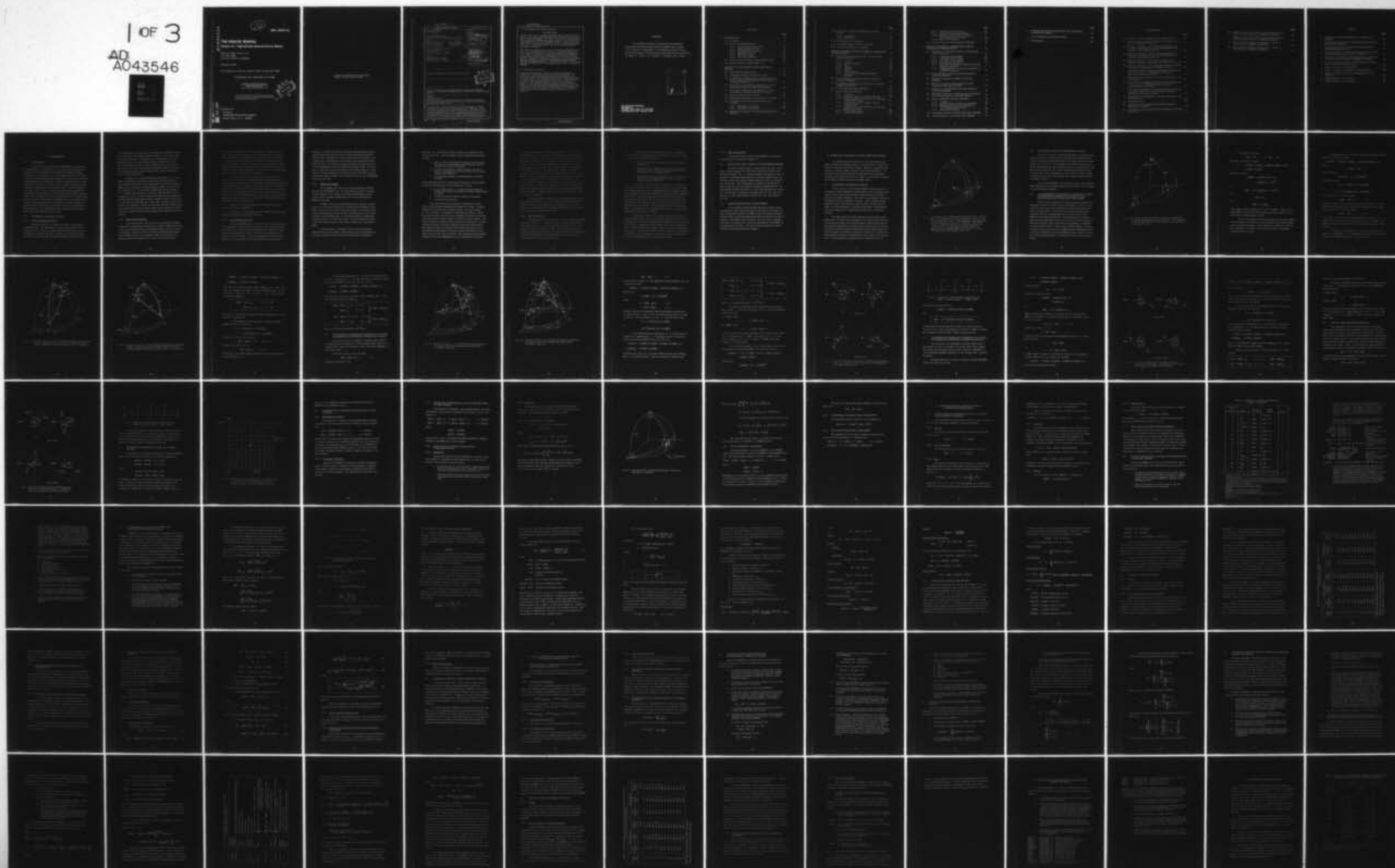

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THE ROSCOE MANUAL

Volume 16 — High-Altitude Neutral-Partical Motion

Science Applications, Inc.
P.O. Box 2351
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8 August 1975

Final Report for Period 1 March 1974—31 January 1975

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Prepared for

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ROSCOE
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One-dimensional Lagrangian Hydrodynamics by Differential Quadrature
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Two preliminary, alternative models of the high-altitude ($h \geq 90$ km) neutral-particle motion have been adopted for use in ROSCOE. Both models are one-dimensional spherical Lagrangian models and describe the vertical hydrodynamic motion in each geocentric column in an array of perhaps 100 such continuous but independent columns covering the disturbed region of interest. The models (SAIHYD, NRLHYD) describe the motion of a set of either Lagrangian cells or points by using the →

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18. SUPPLEMENTARY NOTES (Continued)

EDITORS' NOTE

Volumes 13 to 17 were originally published by SAI to describe the atmospheric, geomagnetic, and high-altitude energy deposition and neutral heave models for ROSCOE. This whole section of code, when associated with an appropriate DRIVER subroutine, operated as a package that ran independently of the rest of the ROSCOE structure. Provision was also made, within this high-altitude package, for two completely independent descriptions of atmospheric heave, each with its own description of atmospheric chemistry.

When GRC incorporated this section of code within the ROSCOE framework, some modifications were necessary, which means that some of the descriptions in Volumes 13 to 17 are inappropriate to ROSCOE as it now exists. In particular, the NRL heave routines (deck NRLHYD) and associated chemistry (deck NRLCHM) are not presently used in ROSCOE. Three other subroutines are different: subroutines ATMOSU, EIF, and XTCOEF correspond to the ROSCOE subroutines ATMOS, EXPINT, and WDXP, respectively. With these exceptions, the subroutines described in Volumes 13 to 17 correspond exactly to those currently in ROSCOE.

20. ABSTRACT (Continued)

method of either difference equations or differential quadrature, respectively. Both models have automatic rezone capability. The geocentric columns defining the geometry for the calculations are described in terms of an arbitrarily positioned and oriented quadrupole coordinate system. Each Lagrangian cell or point is characterized by not only the hydrodynamic properties but also a set of chemistry quantities. The chemistry is loosely coupled to the hydrodynamics. Herein are presented details of the quadrupole coordinate system, the working form of the hydrodynamic equations and their initialization and methods for solution, the results of a test problem for a large-yield event at 200-km altitude producing motion in a linear array of six columns.

PREFACE

For valuable discussions concerning the hydrodynamics model used in the Mission Research Corp. HARC-code, we thank D. H. Sowle and D. Sappenfield. For valuable discussions concerning the hydrodynamics model provided by the Naval Research Laboratory, we thank T. P. Coffey, J. H. Gardner, S. Zalesak, and S. Fisher.

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1. INTRODUCTION

1.1 DEFINITIONS

For the purpose of the New Code development, the phrase atmospheric heave, or simply heave, refers to the motion (the general upwelling) of the atmosphere above approximately 100-km altitude, induced by energy deposition. As a first approximation, the modeling of the overall phenomenon has been broken into two portions: the neutral component (Model No. 15a) and the ionized component (Model No. 15b). These two portions are, of course, closely related, but they have been partially decoupled in this early modeling effort. It was the Committee's plan [see Vol. 13] to model the neutral component (SAI's responsibility) without attention to the ionized component (PDI's responsibility). The modeling of the ionized component involves a structure that uses the results from the neutral-component motion. It should be noted that the ionized component being considered is a weakly-ionized component in the UV halo region, to be used as a basis for describing striations (Model No. 17), and not that in the fireball region which will be described in still another model, No. 11a.

1.2 HISTORICAL BACKGROUND (BRIEF)

1.2.1 Early Developments in Heave

Atmospheric heave is, perhaps, the single most important multiburst effect. The phenomenon was discovered in 1966, first described by R. W. Lowen in a meeting held at the Rand Corporation in May 1966 and reported in HL-66a. (The phrase, atmospheric heave, came into general usage after Hendrick introduced it [He-67a].) The

first calculations were done using a hydrostatic model [HL-66a], but it was recognized early that this neglected a number of effects that were likely to be important. Consequently, better calculations were next performed using a one-dimensional Eulerian hydrodynamics code [HL-67b, HL-67d, HL-69b]. These calculations gave an idea of the time scale for the effect to develop and showed two additional features: a strong upward-moving shock developed early, and an overshoot occurred in the density profile.

Because it was recognized that two-dimensional (or, in a multiburst environment, three-dimensional) effects might well matter, more elaborate calculations in two dimensions were performed with the SHELL code in collaboration with personnel at AFWL, first for x rays alone [Hamlin et al., First Meeting of RANC Working Group held at G. E. TEMPO, Santa Barbara, 1-4 October 1968; HL-69b, Section 2: Comparison of One- and Two-Dimensional Hydrodynamics Calculations of X-Ray-Produced Atmospheric Heave; BF-69], and later with x-rays, UV, and debris included [HL-69c, -69d, -69e]. Several important conclusions were apparent: soft UV was important [Ha-69b], radial motion was important and was the principal cause of later subsidence, and the shock and overshoot shown in the one-dimensional calculations were not present.

1.2.2 RANC IV Heave Models

For systems codes, heave was first incorporated into RANC IV (the formal development of which began in October 1968 with the first of about a half-dozen working-group meetings that occurred every several months). The basic portion of the heave model ultimately developed for RANC IV was a set of equations which described the trace-particle trajectories obtained from a series of one-dimensional,

vertical-column hydrodynamic-code calculations. Multiburst effects were estimated by summing the air-parcel displacements caused by each of the bursts; the displacement increment given by the nth burst to a specific air parcel depended on the altitude of that parcel at the time of the nth burst. The heave model also had a procedure to approximate the multiburst heave-reduction effect, in which the displacement caused by a later burst is reduced because of the extra mass lofted high in the atmosphere by earlier bursts [MF-73a].

Two serious deficiencies in the original heave model were recognized [MF-73a]: slow computational speed and discontinuity of motion across fireball surfaces. The number of multiplications required for a multiburst heave calculation varied as the square of the number of bursts for a small number of bursts and as the cube for a large number. Lack of close coupling between the heave and fireball models was manifested by the ghost-fireball phenomenon, which arose because the heave model did not predict as high a rise rate for air near the fireball as did the fireball motion model [MF-73a].

Fischer [Fi-71c] considered some possibilities for an improved heave model for RANC IV.

A vastly more efficient heave model for RANC IV has also been described by McNamara and Finn [MF-73a].

1.2.3 Old-ROSCOE Heave Model

For the old-ROSCOE code, it was the intent to find a structure for modeling heave which would (1) reproduce the essential predictions of the large three-dimensional two-fluid MHD code calculations (which would form the data base for heave) and (2) run reasonably fast on a computer [YS-73, ZS-73a]. The general approach was to use a quasi-hydrostatic model with faked-in time dependence through adjustable

parameters, values of which were selected so that the density profiles approximated those found from two- and three-dimensional hydrodynamics codes. Results from a preliminary version of the model, with comparisons to hydrodynamics-code results, were presented in April 1973 [ZS-73a]. The model was in almost constant revision until work on the old-ROSCOE code was terminated in November 1973. For example, an improved version of the model, which requires about 1/5 of the number of storage quantities as the earlier version [ZS-73a], has been described by Stuart [St-73a]. For the latest version see the old-ROSCOE final report [LL-75].

1.2.4 HARC Heave Models

For the HARC code, there was less documentation available than for the old-ROSCOE code. The statements that follow are based on notes taken by D. A. Hamlin on 29 January 1974 during a visit by the New Code committee to MRC where D. H. Sowle described the HARC heave model.

In HARC, the heave model describes mass, species, and striations (i.e., the gross-scale variety, not those due to fireballs or beta tubes). There are three ways to get heave results. The first two ways involve interpolations in space and time; the third way is for one event, outside the normal battle mesh, for which the treatment is RANC-like in nature in that it "recreates the world." The third method is always in the code; either the first or the second or both are in, at the user's option.

The first method, developed for BTL, uses pre-computed phenomenology stored on tapes. Thus, the user must accept what is on the tapes, although he can override the fireball and can add debris,

beta rays, etc. An interface routine can fake some quantities if they are not on the tape. Some advantages of pre-computed phenomenology are that:

1. There is none of the delay that normally occurs between the time of a new description of phenomenology and the time that the results are modeled.
2. It is the most accurate, in that it obviates the loss of fidelity in modeling; thus it can be used to verify models used for other purposes.
3. It is the fastest method, provided the tapes are indeed available.

Some disadvantages of pre-computed phenomenology, which precluded it being the only approach to describing heave, are that:

1. It is non-interactive (i.e., choices of burst conditions must be made ahead of the battle and cannot be made during the battle).
2. It limits the systems analyst to what is on the tapes.
3. It requires large storage.

The second method is described as on-line grid, in which multi-one-dimensional Lagrangian hydrodynamics is used. It employs a spherical earth-centered coordinate system. The grid contains $10 \times 10 \times 13$ points, corresponding to approximately 100 km $\times$ 100 km horizontal resolution and Δh vertical resolution, with Δh varying from 7 km at the bottom, 93-km altitude, to 100 km at 400-km altitude. The mesh resolution is limited by storage and not by running time. A heave calculation consists of using the (explicit) Lagrangian hydrodynamics plus Scheibe's chemistry modeling (which feeds back energy to the hydrodynamics) plus Stagat's striation modeling [described in a BTL report and in SC-73a; also see KS-73]. The Lagrangian hydrodynamics is taken [partly] from Sappenfield's version of RADFLO in spherical

geometry; the Richtmyer-von Neumann artificial viscosity is used in describing shocks. Time steps are governed by the White instead of the Courant condition. The bottom cell is fixed; the top cell moves against a constant pressure, so that the force increases as the area increases. There is no rezone capability, which would be desirable. Two advantages of the on-line grid are that (1) there is no modeling required and (2) it is fast. For example, for a 300-sec real-time problem, only 10 sec of CPU time on the CDC 7600 (or 50 sec on CDC 6600 or 130 sec on CDC 6400) is required; the breakdown is about 3 sec for hydrodynamics, 3 sec for chemistry, 3 sec for striations, and 1 sec for plotting. Results are stored at two times t_1 and $t_2 = t_1 + \Delta$, where $\Delta = 1, \ldots, 20, 30$ sec, depending on the time since the last burst; information at intermediate times is obtained by interpolation. A flag is switched instead of data being switched in storage when data at a new t_2 are obtained.

The third method uses White's heave model [Wh-73a] which is quasi-two-dimensional; it is a fit to two-dimensional hydrodynamics. Scheibe's chemistry and Stagat's striation models are again used. Elimination of this third method would be desirable but is prevented by lack of storage for a larger on-line grid.

1.2.5 NRL Heave Model

Subsequent to the initial selection of a heave model as reported in Section 1.4 below, D. A. Hamlin and W. S. Knapp visited NRL on 5 April 1974 where T. P. Coffey described a new type of heave model being developed by J. Gardner of NRL. This model, based on the differential-quadrature technique described by Bellman et al. [BK-72b], had been implemented in a one-dimensional version and was being worked upon in a two-dimensional version.

On 22 April 1974, the COR for the New-Code development, P. B. Fleming, requested SAI to evaluate this promising new model, noting the following appealing aspects:

a. The ease of possible rezoning to keep definition in the battle space.

b. The possibility of advancing each vertical array where desired at a radar rate, thus eliminating the need for storing two arrays at different times.

c. The fact that placement of these vertical arrays can be arbitrarily set up with (perhaps) no need to maintain definite separation distances.

As a result, over the next six-month period, T. P. Coffey kindly made available to SAI a series of evolving versions of the NRL one-dimensional heave model, including both decks (NRLHV1, 13 May 1974; NRLHV2, 18 June 1974; NRLHV3, 10 September 1974; NRLHV4, 13 November 1974) and preliminary memoranda [Ga-74a, Ga-74b, GP-74] and a final report [GP-75]. All versions except the first included the NRL 12-species E- and F-region chemistry package (the NRL SIMPLE code [Al-73]). During the period from May to October 1974, we exercised these codes and made timing runs, reported in the bimonthly progress reports to GRC.

On 16 October 1974, P. B. Fleming requested SAI to incorporate the NRL heave code into the SAI high-altitude grid module as an alternative heave model. We undertook this additional task as a parallel effort while we completed the high-altitude grid module containing the more conventional difference-equation treatment of the Lagrangian hydrodynamics. Also in October 1974, NRL was requested to incorporate an automatic rezone capability into their code, which was included in the version NRLHV4 delivered on 13 November 1974.

1.2.6 Other Heave Models

Treatments of heave in WOE II and OPTIR are described in SD-73b (Section 5) and MS-73c (Chapter V).

1.3 RELATION OF HEAVE MODEL TO OTHER ROSCOE MODELS

The heave model will play a central role in the code. Tentatively, the heave model (No. 15a) will be affected by models for the ambient atmosphere (No. 1), radiation transport and deposition (No. 4), possibly low-altitude fireball motion (No. 5a) for fireballs rising into the heave mesh, high altitude fireball motion (No. 11a), and chemistry (No. 11b and 16). The models that are (tentatively) affected by the heave model are those for radiation transport and deposition (No. 4), high-altitude fireball properties (No. 11a), high-altitude debris motion (No. 12a and 12b), UV generation and deposition (No. 14), heave (ion motion, No. 15b), high-altitude chemistry (No. 1b), and striations (No. 17).

1.4 INITIAL SELECTION OF A HEAVE MODEL

In early 1974 it seemed that the consensus of the New Code committee was that each existing heave model was far from ideal, but that a model patterned after the HARC on-line grid model would have the best chance of becoming operational within the allowed time and resources. Accordingly, SAI initially put most of its heave-modeling effort into a thorough review, revision, and extension of the HARC online grid model for heave. This choice largely dictated the overall structure of the high-altitude grid module.

2. GEOMETRY OF THE HIGH-ALTITUDE GRID (HAG) MODULE

In computing the hydrodynamics in a one-dimensional (geocentric) spherical coordinate system, it is not necessary to specify the lateral (or angular) extent of the 'column.' However, in depositing the energy for an event, which is going to drive the hydrodynamics, it is necessary to deal with specifically located boundaries and absolute amounts of areal densities and mass. Thus, it is necessary to describe the coordinate systems used in the SAI HAG module.

2.1 QUADRUPOLE COORDINATE SYSTEM

First, however, we note that the HARC code used an array of steradianal columns bounded by meridian planes in the geographic north-south direction and by conical surfaces (which intersect the Earth's surface in parallels of latitude). The cells in a steradianal column were bounded by (geocentric) spherical surfaces. Thus, a HARC cell had spherical caps for top and bottom, plane surfaces for east and west sides, and conical surfaces for north and south sides. Determination of the line segments of a ray path through such cells is extremely complex.

We made a number of improvements and corrections on the HARC grid. Two major improvements are (1) replacement of the conical surfaces by another set of meridian planes, thereby using what we have termed a quadrupole coordinate system (since there are east and west poles as well as north and south poles) and (2) replacement of the fixed geographic north-south orientation by an arbitrary orientation, so that we speak of artificial (or quadrupole) north, south, east, and west poles. The quadrupole coordinate system is illustrated in Fig. 1.

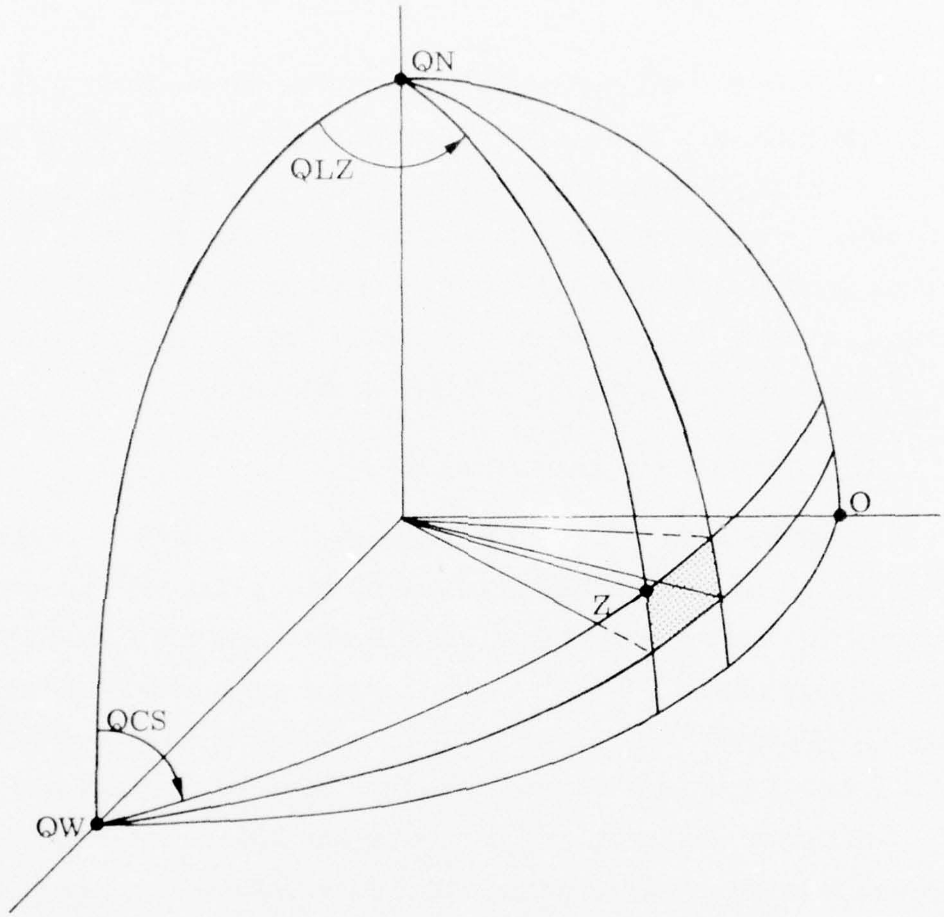


Fig. 1. Geocentric Column in Quadrupole Coordinate System. QN and QW are the quadrupole north and quadrupole west poles, and O is the quadrupole origin. The quadrupole south and quadrupole east poles are not shown for simplicity. The shaded region is a spherical-surface cross-section through a geocentric column. The quadrupole colatitude (QCZ) and quadrupole east longitude (QLZ) of the Point Z are shown. The origin need not be at QCZ = QLZ = 90°.

2.2 GEOGRAPHIC AZIMUTH OF QUADRUPOLE SYSTEM

In practice, we have oriented the quadrupole coordinate system so that an artificial north-south meridian will pass through the north pole of the magnetic dipole determined by the ambient geomagnetic field model [Vol. 3, LS-75]. This orientation was selected because it was initially thought that such an orientation would be convenient for the striations model (Model No. 17). Later development indicated there was no need to have such an orientation. It can be easily changed; indeed, in the GRC version of the HAG module, the orientation has been made completely arbitrary.

The azimuth (ALPHA) of the grid is set equal to the declination angle (DECANG) of the magnetic dipole field at the grid origin, obtained by calling Subroutine BFIELD.

2.3 ESTABLISHMENT OF QUADRUPOLE COORDINATE SYSTEM FOR ARBITRARY QUADRUPOLE COLATITUDE AND QUADRUPOLE EAST LONGITUDE OF GRID ORIGIN

Although we have described how the geographic azimuth of the quadrupole coordinate system has been established, it remains to describe how the locations of the quadrupole-north and quadrupole-west poles are established. To do this we note that the geographic east longitude (GLO) and colatitude (GCO) of the grid origin are set by DRIVER reading Namelist SETUP1. The quadrupole east longitude (QLO) and colatitude (QCO) of the grid origin are also set, normally to 90 deg but allowably in the range between 0 and 180 deg, by DRIVER reading Namelist SETUP1. These values of QLO and QCO, converted to radians and passed to Subroutine GRIDON through PARAMS Common, are used to establish the arc length (OQN) from the origin to the north pole in the quadrupole system, as illustrated in Fig. 2 and derived as follows.

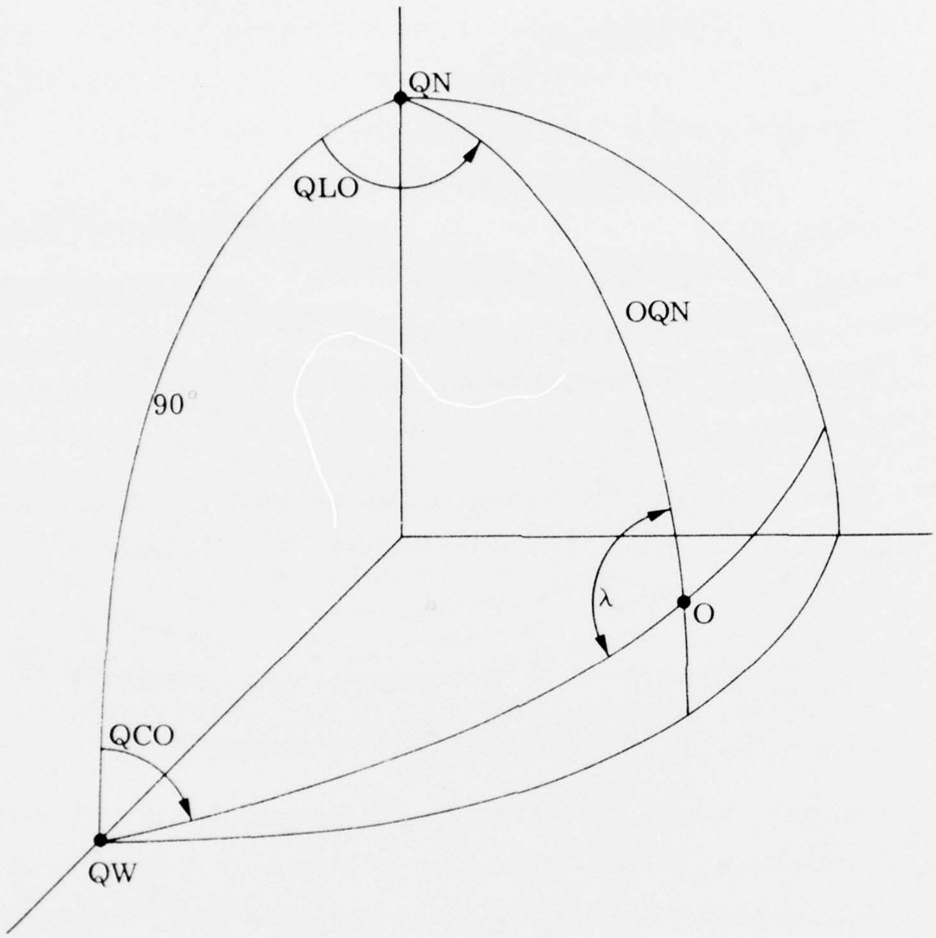


Fig. 2. Geometry for Determining the Location of the Quadrupole North (QN) and Quadrupole West (QW) Poles. The quadrupole colatitude (QCO) and east longitude (QLO) of the quadrupole origin (O) are given.

For simplicity, assume

$$0 < QCO < 180^\circ \quad , \qquad 0 < QLO < 180^\circ \quad .$$

By the law of cosines for angles,

$$\begin{aligned} \cos\lambda &= -\cos(QCO)\cos(QLO) + \sin(QCO)\sin(QLO)\cos 90^\circ \\ &= -\cos(QCO)\cos(QLO) \quad . \end{aligned}$$

By the law of sines,

$$\begin{aligned} \sin(OQN) &= \sin(QCO)\sin 90^\circ/\sin\lambda \\ &= \sin(QCO)/(1 - \cos^2\lambda)^{\frac{1}{2}} \end{aligned}$$

or

$$OQN = \sin^{-1}\left[\sin(QCO)/(1 - \cos^2\lambda)^{\frac{1}{2}}\right] \quad .$$

If

$$QCO > 90^\circ \quad ,$$

set

$$OQN = \pi - OQN_p \quad ,$$

where OQN_p is the principal value of $\sin^{-1}$ (sin OQN). Thus, the arc length OQN is determined and the quadrupole north pole (QN) is located with respect to the quadrupole origin O.

We now must establish (a) the geographic east longitude (GLQN) of the quadrupole north pole and (b) the quadrupole east longitude (QLN) of the geographic north pole. These relations are needed in converting the coordinates of an arbitrary point from geographic to quadrupole coordinates and vice versa.

By applying the law of cosines for sides to the triangle O-QN-N in Fig. 3a or Fig. 3b, we have

$$\cos(\mathrm{GCQN}) = \cos(\mathrm{GCO}) \cos(\mathrm{OQN}) + \sin(\mathrm{GCO}) \sin(\mathrm{OQN}) \cos|\alpha| \quad ,$$

where

$$0 < \mathrm{GCQN} < 180^\circ \quad ,$$

but we will need

$$\sin(\mathrm{GCQN}) = \left[1 - \cos^2(\mathrm{GCQN})\right]^{\frac{1}{2}} \quad .$$

By the law of sines,

$$\sin\beta = \sin(\mathrm{OQN}) \sin|\alpha| / \sin(\mathrm{GCQN})$$

or

$$\beta = \sin^{-1}\left[\sin(\mathrm{OQN}) \sin|\alpha| / \sin(\mathrm{GCQN})\right] \quad .$$

From Fig. 3a (for $\alpha > 0$) we see that

$$\mathrm{GLQN} = \mathrm{GLO} + \beta \quad , \qquad \alpha > 0$$

provided the angle β is not cut by the Greenwich (G) axis; if it is, then GLQN would exceed 2π and we would have to subtract 2π from GLQN. From Fig. 3b (for $\alpha < 0$) we see that

$$\mathrm{GLQN} = \mathrm{GLO} - \beta \quad , \qquad \alpha < 0$$

provided the angle β is not cut by the Greenwich (G) axis; if it is, then GLQN would be negative and we would have to add 2π to GLQN. Thus, GLQN is determined except for the effect of an uncertainty in the proper quadrant for β.

To determine the quadrant for β, we first consider the consequence of β equalling 90°, i.e., by applying the law of cosines for sides to the triangle O-QN-N in Fig. 3a or Fig. 3b, we have

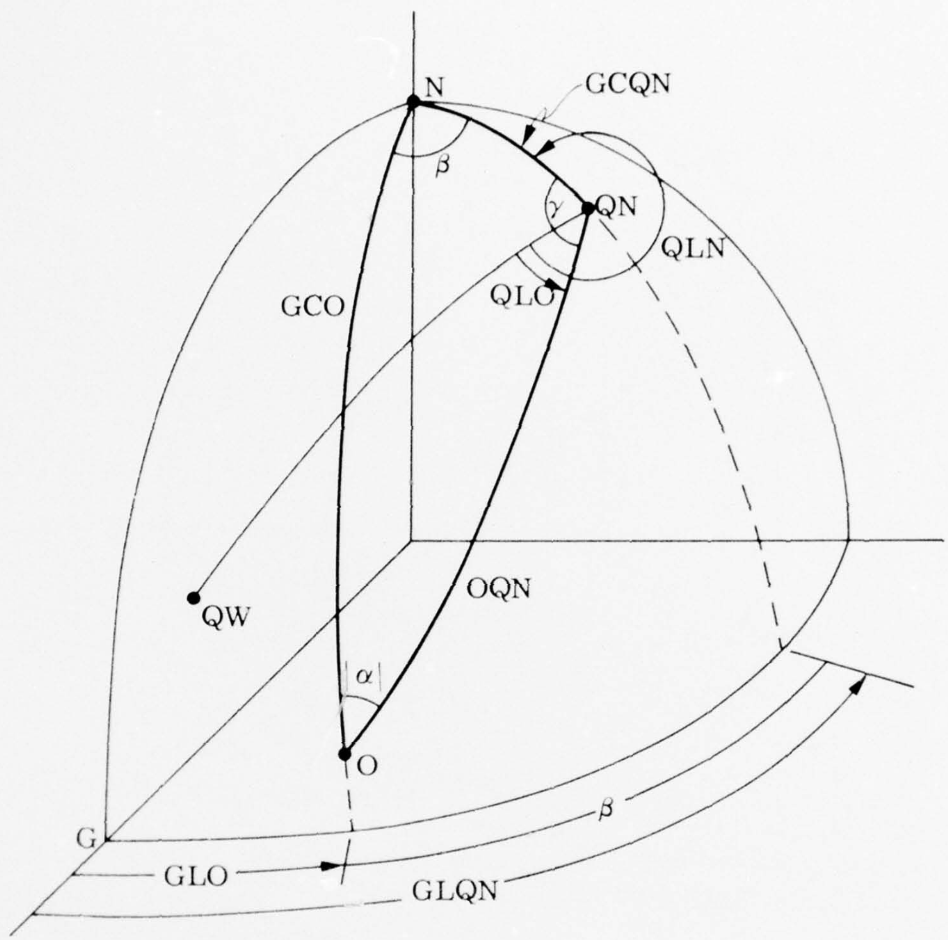


Fig. 3a. Geometry Used (for $\alpha > 0$) in Deriving Geographic East Longitude (GLQN) of Quadrupole North Pole (QN) and Quadrupole East Longitude (QLN) of Geographic North Pole (N). G is Greenwich.

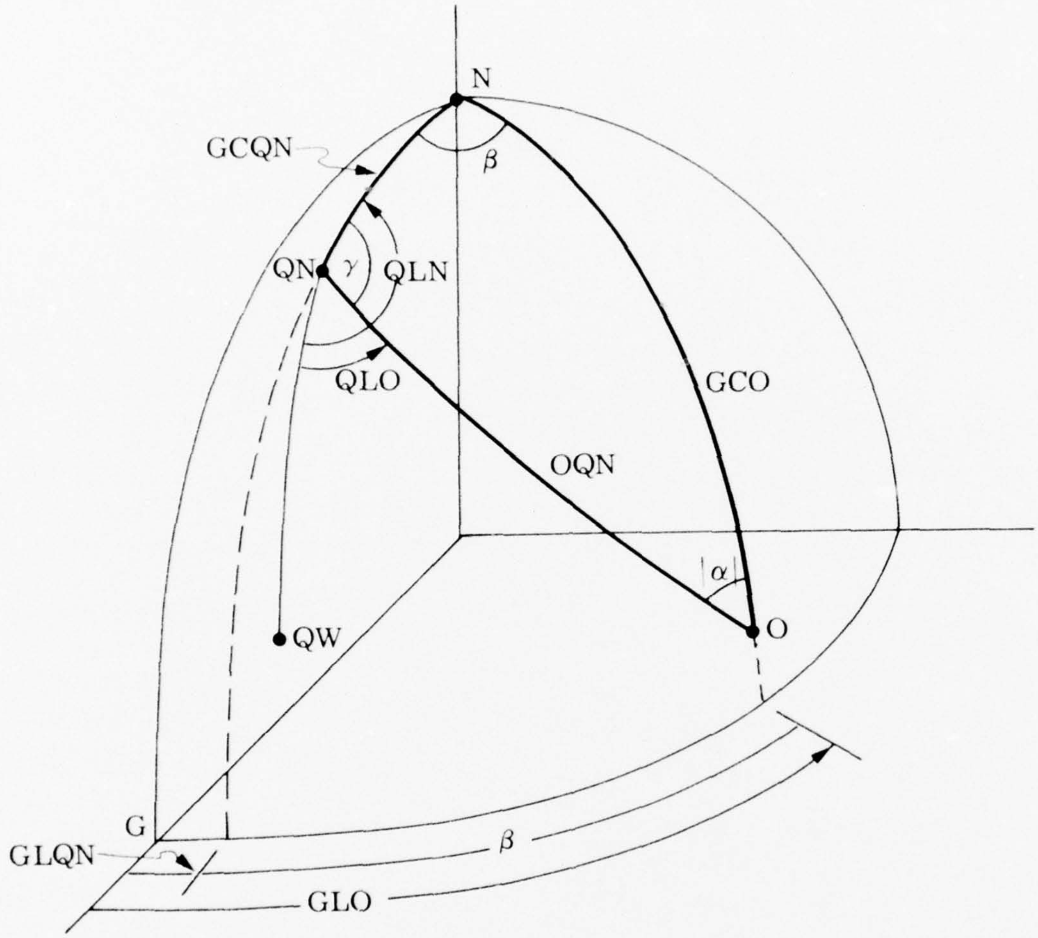


Fig. 3b. Geometry Used (for $\alpha < 0$) in Deriving Geographic East Longitude (GLQN) of Quadrupole North Pole (QN) and Quadrupole East Longitude (QLN) of Geographic North Pole (N). G is Greenwich.

$$\cos(OQN) = \cos(GCO)\cos(GCQN) + \sin(GCO)\sin(GCQN)\cos\beta$$

$$\cos(OQN)_R = \cos(GCO)\cos(GCQN) \ .$$

From Fig. 3a or 3b we see that if $OQN > (OQN)_R$, then $\beta > 90°$. However, the computer will return only the principal value ($\beta_p \le 90°$) of $\sin^{-1}(\sin\beta)$. Thus, if $\beta > 90°$, we want $\beta = \pi - \beta_p$. Thus, the final formulas for GLQN are

$$\boxed{\begin{aligned} GLQN &= GLO \pm \beta_p \ , && \alpha \gtrless 0, \ \beta \le 90° \\ &= GLO \pm (\pi - \beta_p) \ , && \alpha \gtrless 0, \ \beta > 90° \end{aligned}}$$

to which 2π is subtracted or added if GLQN is greater than 2π or less than zero, respectively.

To obtain QLN we first apply the law of sines to triangle O-QN-N in Fig. 3a or 3b to get

$$\sin\gamma = \sin(GCO)\sin|\alpha|/\sin(GCQN)$$

$$\gamma = \sin^{-1}\left[\sin(GCO)\sin|\alpha|/\sin(GCQN)\right] \ .$$

From Fig. 3a (for $\alpha > 0$) we see that

$$QLN = QLO - \gamma + 2\pi \qquad \text{for } \alpha > 0$$

and from Fig. 3b (for $\alpha < 0$),

$$QLN = QLO + \gamma \qquad \text{for } \alpha < 0 \ .$$

Thus, QLN is determined except for the effect of an uncertainty in the proper quadrant for γ.

To determine the quadrant for γ, we first consider the consequence of γ equalling 90°, i.e., by applying the law of cosines for sides to the triangle O-QN-N in Fig. 3a or Fig. 3b, we have

$$\cos(GCO) = \cos(OQN)\cos(GCQN) + \sin(OQN)\sin(GCQN)\cos\gamma$$

$$\cos(GCO)_R = \cos(OQN)\cos(GCQN) \ .$$

From Fig. 3a or Fig. 3b, we see that if $GCO > (GCO)_R$, then $\gamma > 90^\circ$. Thus, the final formulas for QLN are

$$\boxed{\begin{aligned} QLN &= QLO - \gamma_p + 2\pi \quad \text{for } \alpha > 0 \\ &= QLO + \gamma_p \qquad\quad\ \text{for } \alpha < 0 \end{aligned} \Bigg\} \text{ if } GCO < (GCO)_R \\ \begin{aligned} QLN &= QLO - (\pi - \gamma_p) + 2\pi \quad \text{for } \alpha > 0 \\ &= QLO + (\pi - \gamma_p) \qquad\quad\ \text{for } \alpha < 0 \end{aligned} \Bigg\} \text{ if } GCO > (GCO)_R ,}$$

where γ_p is the principal value of $\sin^{-1}(\sin\gamma)$.

2.4 CONVERSION OF GEOGRAPHIC COORDINATES OF A POINT TO QUADRUPOLE COORDINATES (SUBROUTINE GEOQUA)

The conversion from geographic coordinates (GCX, GLX) of an arbitrary point to quadrupole coordinates (QCX, QLX), applied to an event-point X in Subroutine INDEX by a call to Subroutine GEOQUA, is derived as follows.

From Fig. 4a (for $\epsilon > 0$) we see that

$$QLX = QLN - 2\pi + \gamma \ , \qquad \epsilon > 0$$

and from Fig. 4b (for $\epsilon < 0$)

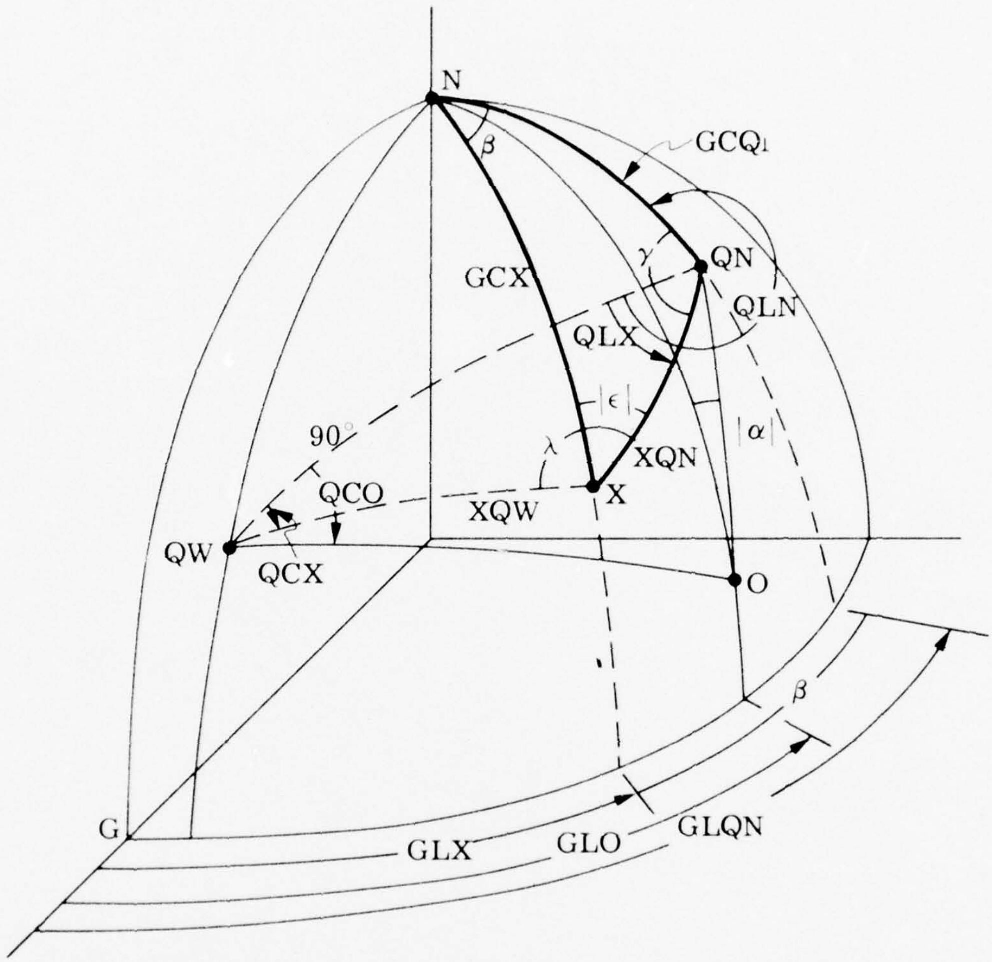


Fig. 4a. Geometry Used (for $\epsilon > 0$) in Deriving Conversions Between Geographic (GCX, GLX) and Quadrupole (QCX, QLX) Coordinates of Point X.

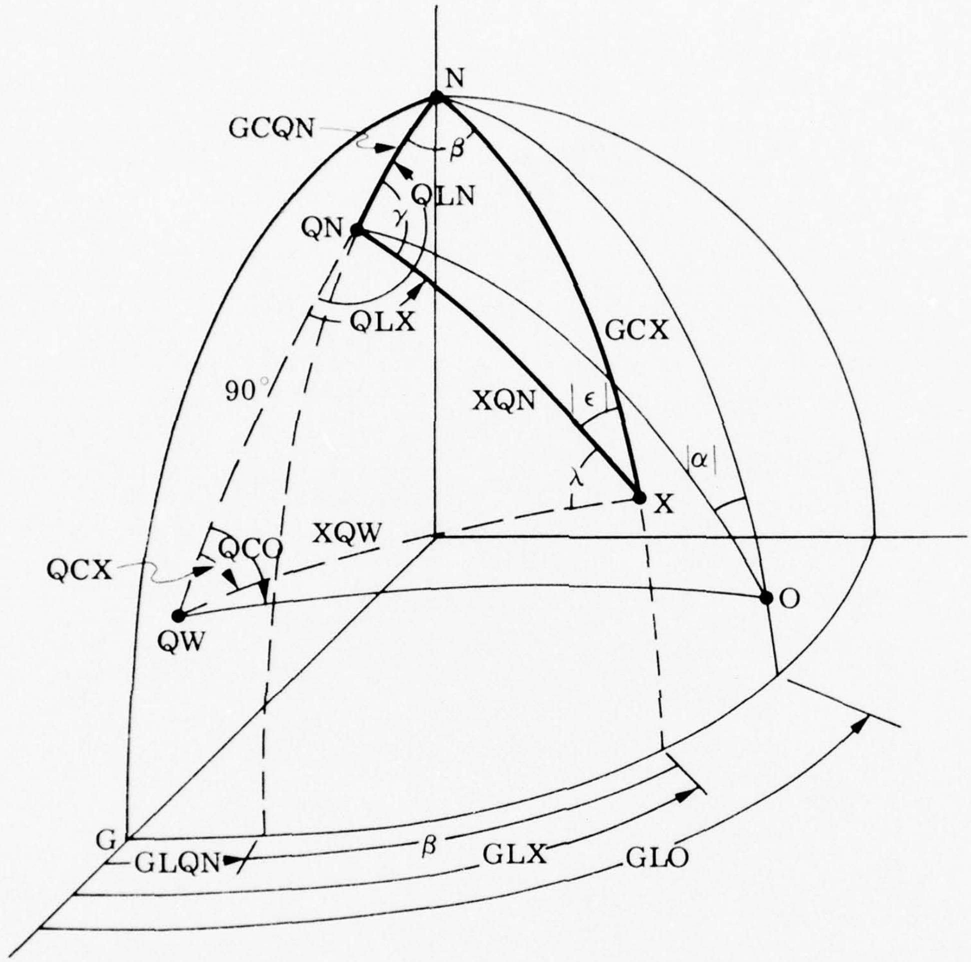


Fig. 4b. Geometry Used (for $\epsilon < 0$) in Deriving Conversions Between Geographic (GCX, GLX) and Quadrupole (QCX, QLX) Coordinates of Point X.

$$QLX = QLN - \gamma \ , \qquad \epsilon < 0 \ .$$

From the law of cosines for sides applied to triangle X-QN-N in Fig. 4a or Fig. 4b, we have

$$\cos(XQN) = \cos(GCX)\cos(GCQN) + \sin(GCX)\sin(GCQN)\cos\beta$$

but we need

$$\sin(XQN) = \left[1 - \cos^2(XQN)\right]^{\frac{1}{2}} \ ,$$

where

$$\beta = GLQN - GLX \ , \qquad \epsilon > 0$$

$$= GLX - GLQN \ , \qquad \epsilon < 0 \ .$$

As can be seen from a polar-plot about the geographic north pole (N), β cannot exceed π. Thus, if from one of these expressions β is found to exceed π, we must replace β by $2\pi - \beta$. From the law of sines,

$$\sin\gamma = \sin(GCX)\sin\beta/\sin(XQN)$$

or

$$\gamma = \sin^{-1}\left[\sin(GCX)\sin\beta/\sin(XQN)\right] \ .$$

To determine the proper quadrant for γ, we consider the consequence of γ equalling 90°; i.e., by applying the law of cosines for sides to the triangle X-QN-N in Fig. 4a or Fig. 4b,

$$\cos(GCX) = \cos(XQN)\cos(GCQN) + \sin(XQN)\sin(GCQN)\cos\gamma$$

$$\cos(GCX)_R = \cos(XQN)\cos(GCQN) \ .$$

From Fig. 4a or Fig. 4b, we see that if GCX is greater than $(GCX)_R$, then $|\gamma|$ is greater than 90°. Thus, the formulas for QLX become

$$
\begin{array}{|llll|}
\hline
\text{QLX} & = \text{QLN} - 2\pi + \gamma_p & \text{for } \epsilon > 0 & \multirow{2}{*}{$\left.\begin{array}{l}\\ \\ \end{array}\right\}$ if GCX < (GCX)$_R$} \\
 & = \text{QLN} - \gamma_p & \text{for } \epsilon < 0 & \\
 & = \text{QLN} - 2\pi + (\pi - \gamma_p) & \text{for } \epsilon > 0 & \multirow{2}{*}{$\left.\begin{array}{l}\\ \\ \end{array}\right\}$ if GCX > (GCX)$_R$} \\
 & = \text{QLN} - (\pi - \gamma_p) & \text{for } \epsilon < 0 & \\
\hline
\end{array}
$$

where γ_p is the principal value of $\sin^{-1}(\sin\gamma)$.

It remains to establish formal criteria for determining the sign of angle ϵ. From the polar plots in Fig. 5, one can establish the following criteria:

For GLQN > GLX,

$$\epsilon \gtreqless 0 \qquad \text{as GLQN - GLX} \lesseqgtr \pi \ ;$$

for GLQN < GLX,

$$\epsilon \lesseqgtr 0 \qquad \text{as GLX - GLQN} \gtreqless \pi \ .$$

It is also useful to consider the diagram in Fig. 6 which shows values of ϵ as the parameter $\delta \equiv$ GLQN - GLX varies. For $\delta = \pm\pi$, the angle γ equals 0. For $\delta = 0$, γ equals π if GCQN < GCX and γ equals 0 if GCQN > GCX.

Now we determine QCX. First, from the laws of cosines for sides applied to triangle X-QN-QW in Fig. 4a or 4b, we have

$$\begin{aligned}\cos(\text{XQW}) &= \cos 90^\circ \cos(\text{XQN}) + \sin 90^\circ \sin(\text{XQN}) \cos(\text{QLX}) \\ &= \sin(\text{XQN}) \cos(\text{QLX})\end{aligned}$$

but we need

$$\sin(\text{XQW}) = \left[1 - \cos^2(\text{XQW})\right]^{\frac{1}{2}} \ .$$

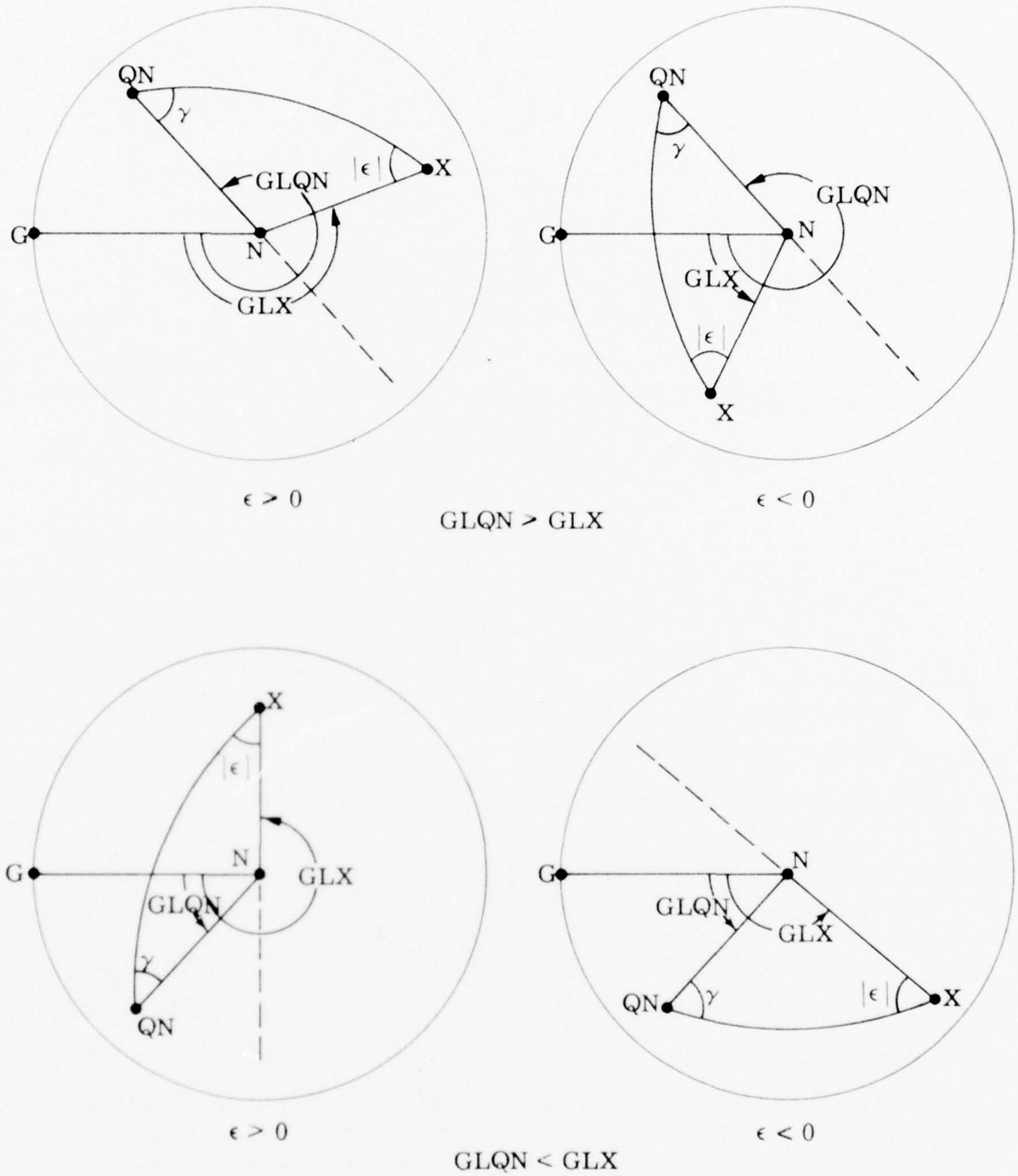


Fig. 5. Polar Plots About Geographic North (N) Illustrating Dependence of the Sign of Angle ε on the Relative Positions of Quadrupole North (QN) and the Point X.

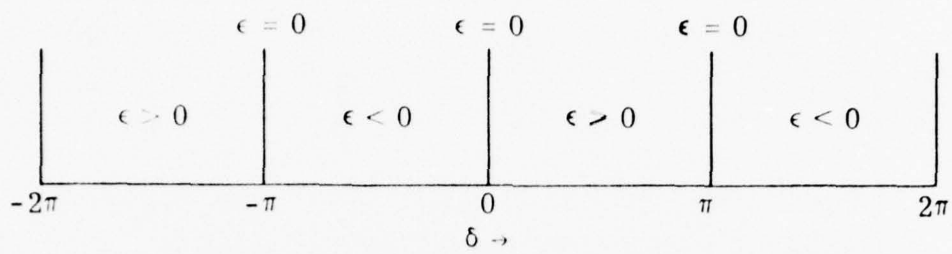


Fig. 6. Illustration of the Dependence of the Sign of the Angle ϵ on the Parameter $\delta \equiv$ GLQN - GLX.

From the law of sines, we have

$$\sin(QCX) = \sin(XQN)\ \sin(QLX)/\sin(XQW)$$

and

$$\boxed{QCX = \sin^{-1}\left[\sin(XQN)\ \sin(QLX)/\sin(XQW)\right]\ .}$$

To determine the proper quadrant for QCX, we replace Point O by Point X in Fig. 2 and note that QCX is less than 90° if XQN is less than 90° and QCX is greater than 90° if XQN is greater than 90°.

2.5 CONVERSION OF QUADRUPOLE COORDINATES OF A POINT TO GEOGRAPHIC COORDINATES (SUBROUTINE QUAGEO)

The conversion from quadrupole coordinates (QCX, QLX) of the arbitrary Point X to geographic coordinates (GCX, GLX), applied to the north and west sides of the columns in Subroutine GRIDON by a call to Subroutine QUAGEO although it is not currently used, is derived as follows.

By applying the law of cosines for angles to triangle X-QN-QW in Fig. 4a or Fig. 4b, we have

$$\cos\lambda = -\cos(QCX)\cos(QLX) + \sin(QCX)\sin(QLX)\cos 90^\circ$$

$$= -\cos(QCX)\cos(QLX)$$

but we will need

$$\sin\lambda = \left[1 - \cos^2\lambda\right]^{\frac{1}{2}} \quad .$$

By the law of sines, we have

$$\sin(XQN) = \sin(QCX)\sin 90^\circ/\sin\lambda$$

$$= \sin(QCX)/\sin\lambda$$

or

$$XQN = \sin^{-1}\left[\sin(QCX)/\sin\lambda\right] \quad .$$

XQN is less than 90° if QCX is less than 90° and is more than 90° if QCX is more than 90°, as may be seen from Fig. 2. From Fig. 4a (for $\epsilon > 0$), we see that

$$\gamma = QLX + 2\pi - QLN \;, \qquad \epsilon > 0$$

and from Fig. 4b (for $\epsilon < 0$),

$$\gamma = QLN - QLX \;, \qquad \epsilon < 0 \;.$$

However, from the polar plots about quadrupole north in Fig. 7, we see that in general

$$\gamma = |QLN - QLX|$$

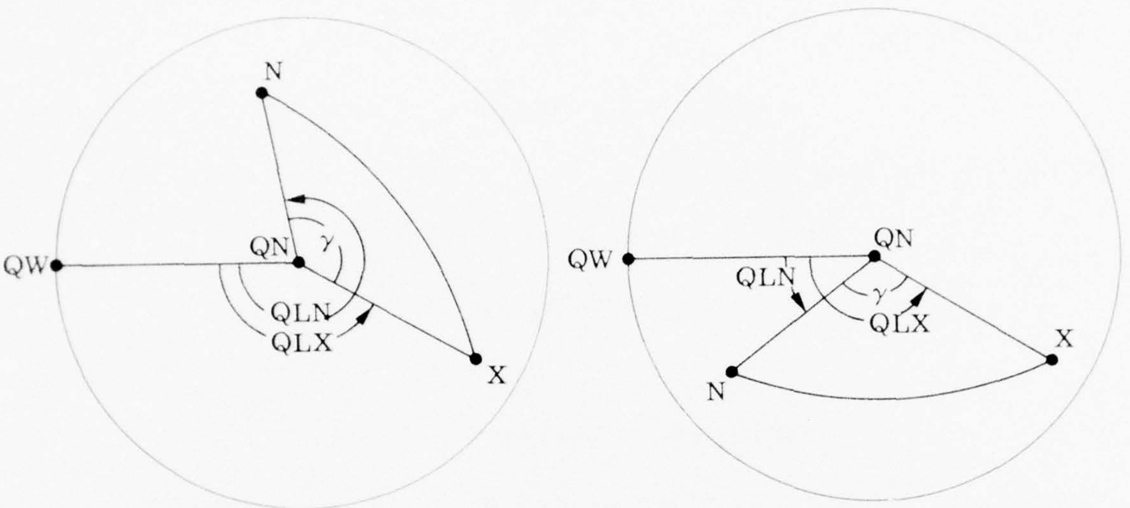
or

$$\gamma = 2\pi - |QLN - QLX|$$

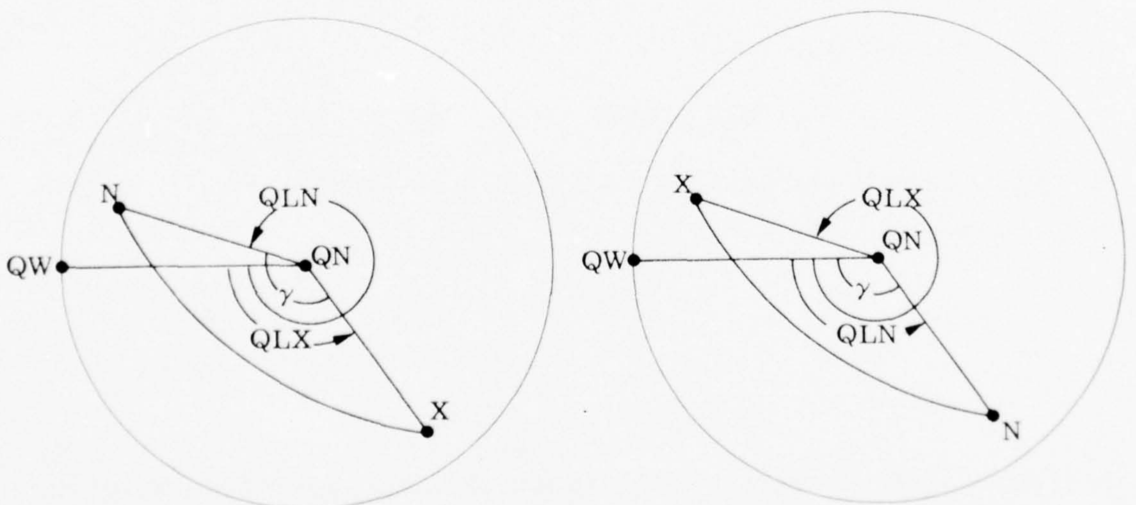
if $|QLN - QLX|$ exceeds π. By the law of cosines for sides applied to triangle X-QN-N in Fig. 4a and Fig. 4b, we have

$$\cos(GCX) = \cos(XQN)\cos(GCQN) + \sin(XQN)\sin(GCQN)\cos\gamma \;,$$

or our desired expression for GCX,



$$\gamma = |QLN - QLX|$$



$$\gamma = 2\pi - |QLN - QLX|$$

Fig. 7. Polar Plots About Quadrupole North (QN) Illustrating Dependence of Polar Angle γ on Quadrupole East Longitudes of Geographic North (QLN) and Point X (QLX).

$$\boxed{GCX = \cos^{-1}\left[\cos(XQN)\cos(GCQN) + \sin(XQN)\sin(GCQN)\cos\gamma\right] .}$$

We will also need

$$\sin(GCX) = \left[1 - \cos^2(GCX)\right]^{\frac{1}{2}} .$$

There is not a problem with respect to quadrant identification for GCX since the physical range of GCX, 0 to π, is the same as the range of the principal values of $\cos^{-1}[\cos(GCX)]$.

To determine GLX, we first apply the law of sines to triangle X-QN-N in Fig. 4a or Fig. 4b to get

$$\sin\beta = \sin(XQN)\sin\gamma/\sin(GCX)$$

or

$$\beta = \sin^{-1}\left[\sin(XQN)\sin\gamma/\sin(GCX)\right] .$$

To determine the proper quadrant for β, we consider the consequence of β equalling 90°, i.e., by applying the law of cosines for sides to triangle X-QN-N, we have

$$\cos(XQN) = \cos(GCX)\cos(GCQN) + \sin(GCX)\sin(GCQN)\cos\beta$$

$$\cos(XQN)_R = \cos(GCX)\cos(GCQN) .$$

Thus, β is less than 90° if XQN is less than $(XQN)_R$ and β is greater than 90° if XQN is greater than $(XQN)_R$.

Finally, from Fig. 4a (for $\epsilon > 0$) and Fig. 4b (for $\epsilon < 0$) we see that

$$\boxed{\begin{array}{lll} GLX = GLQN \mp \beta_p & \text{for } \epsilon \gtrless 0 , & XQN < (XQN)_R \\ GLX = GLQN \mp (\pi - \beta_p) & \text{for } \epsilon \gtrless 0 , & XQN \geq (XQN)_R , \end{array}}$$

where β_p is the principal value of $\sin^{-1}(\sin\beta)$.

It remains to establish formal criteria for determining the sign of the angle ϵ. From the polar plots in Fig. 8, one can establish the following criteria:

For QLN > QLX,

$$\epsilon \gtreqless 0 \qquad \text{as QLN - QLX} \lesseqgtr \pi \ ;$$

for QLN < QLX,

$$\epsilon \lesseqgtr 0 \qquad \text{as QLX - QLN} \lesseqgtr \pi \ .$$

It is also useful to consider the diagram in Fig. 9 which shows values of ϵ as the parameter $\mu \equiv$ QLN - QLX varies. For $\mu = \pm\pi$, the angle β equals 0. For $\mu = 0$, β equals π if QCN < QCX and β equals 0 if QCN > QCX.

2.6 SPECIAL TRANSFORMATION PROBLEMS

If the quadrupole north is in close proximity to geographic north, the transformation of the colatitude of Point X from one coordinate system to the other is calculated in the usual manner. However, there may be an angular displacement in the longitude of Point X between the two coordinate systems. This angular displacement is the difference between GLO (geographic longitude of the origin) and QLO (quadrupole longitude of the origin). Thus, in transforming from the geographic to the quadrupole system, the quadrupole longitude of Point X is given by

$$\text{QLX} = \text{GLX} - (\text{GLO} - \text{QLO}) \ ;$$

in transforming from the quadrupole to the geographic system, the geographic longitude of Point X is given by

$$\text{GLX} = \text{QLX} - (\text{QLO} - \text{GLO}) \ .$$

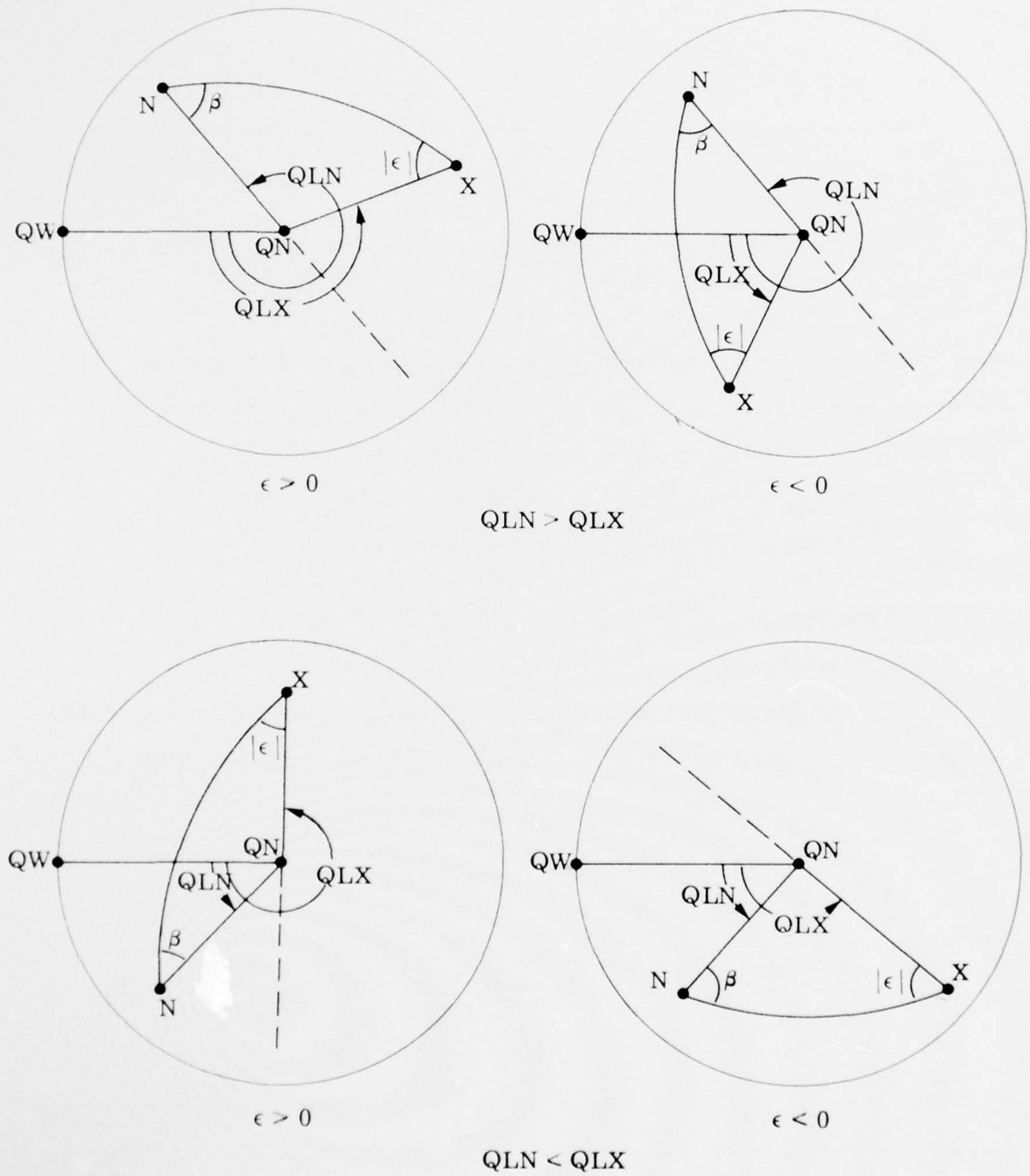


Fig. 8. Polar Plots About Quadrupole North (QN) Illustrating Dependence of the Sign of the Angle ϵ on the Relative Positions of Geographic North (N) and the Point X.

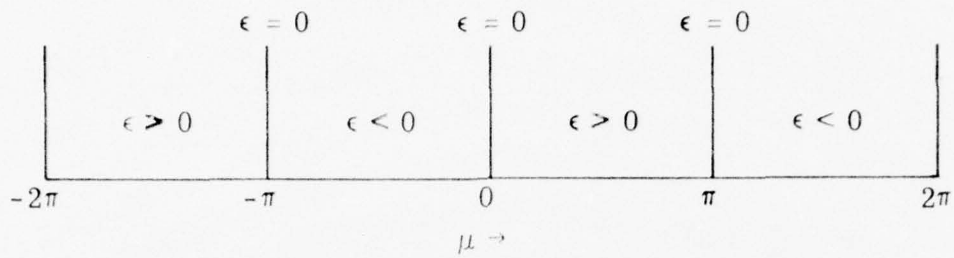


Fig. 9. Illustration of the Dependence of the Sign of the Angle ϵ on the Parameter $\mu \equiv$ QLN - QLX.

In the general situation, where quadrupole north and geographic north are separated, there is one caution to be noted. If the Point X lies on the great circle passing through both quadrupole north and geographic north, the point may not be transformed correctly from one system to the other without a modification of the code.

2.7 QUADRUPOLE COORDINATES OF TOP-LEFT CORNER OF GRID

The quadrupole east longitude (QLMIN) and colatitude (QCMIN) of the top-left corner of the grid (see Fig. 10) are computed from

$$\text{QLMIN} = \text{QLEBOT} + 0.5 \times \text{DELY}$$

$$\text{QCMIN} = \text{QCSBOT} + 0.5 \times \text{DELX}$$

where

$$\text{QLEBOT} = \text{QLO} - \text{NYQW} \times \text{DELY}$$

$$\text{QSCBOT} = \text{QCO} - \text{NXQN} \times \text{DELX}$$

and NYQW and NXQN are the number of columns to quadrupole west and north, respectively, of the grid origin and DELX and DELY are the angular widths of the columns in the quadrupole X-direction and Y-direction, respectively. The quantities NXQN, NYQW, DELX, and

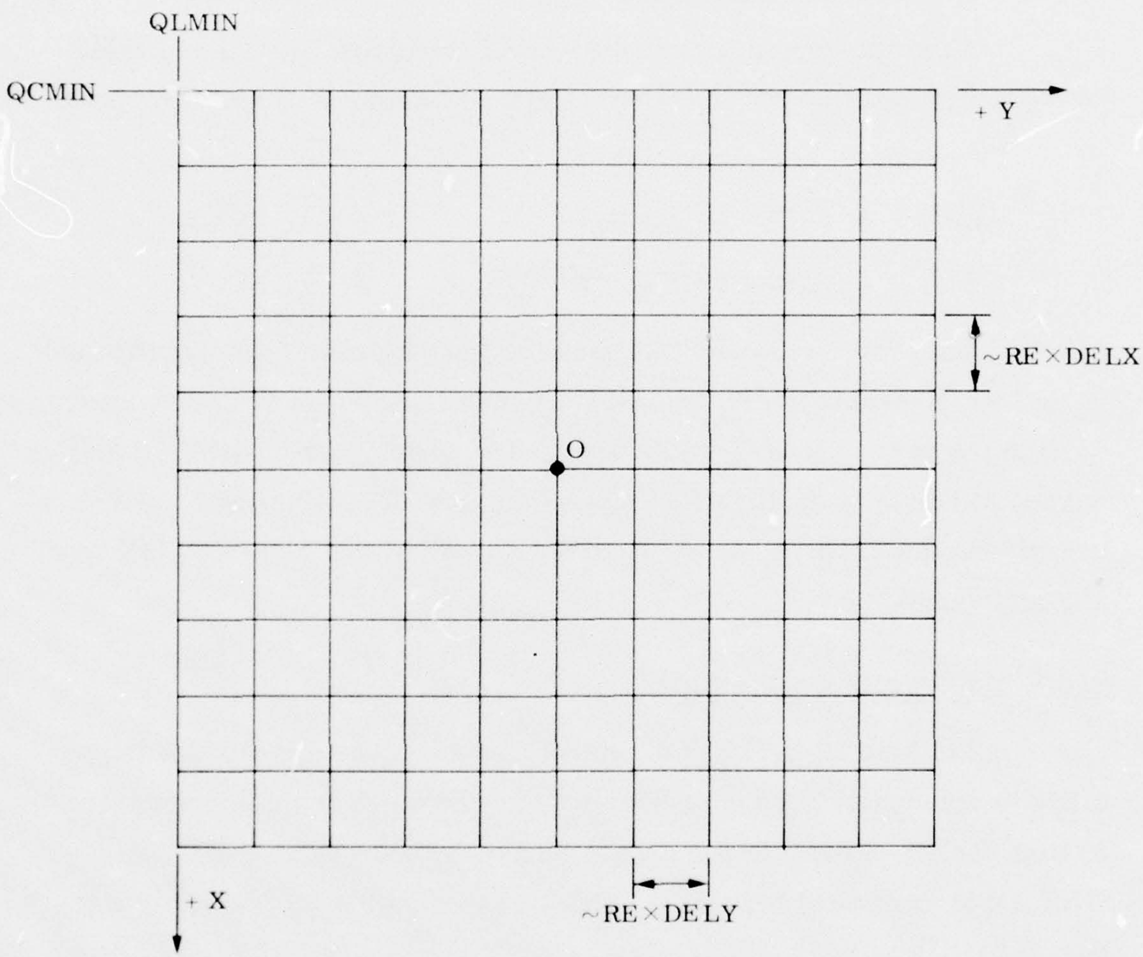


Fig. 10. Quadrupole Grid. Schematic plan view of the quadrupole grid shows location of the top-left (north-west) corner with respect to grid origin O. Cell boundaries are not squares (or even rectangles) as shown for simplicity but are great circles.

DELY are set by DRIVER reading Namelist SETUP1 and passed to GRIDON through PARAMS Common.

2.8 COORDINATES OF THE NORTH AND WEST SIDES OF THE COLUMNS

2.8.1 Quadrupole Coordinates

The quadrupole coordinates, east longitude (QL(J)) and colatitude (QC(I)), of the west and north sides of Column (I, J) are computed from

$$QC(I) = QCMIN + DELX \times (I - 1) \ , \qquad I = 1, \ NCELX$$

$$QL(J) = QLMIN + DELY \times (J - 1) \ , \qquad J = 1, \ NCELY$$

where I and J are the column indices in the quadrupole X-direction and Y-direction, respectively, and NCELX and NCELY are the total number of columns in the quadrupole X- and Y-directions, set in DRIVER and passed to GRIDON through PRPREG Common. The sines and cosines of both QC(I) and QL(J) (SNQC(I), CSQC(I), SNQL(J), and CSQL(J)) are also computed.

2.8.2 Geographic Coordinates

DO-loop 32 in GRIDON, developed as a possibly-needed capability to convert column coordinates from the quadrupole coordinate system (QC(I), QL(J)) to the geographic coordinate system (GC(I, J), GL(I, J)) is currently bypassed. The transformation is derived in Section 2.5.

2.9 QUADRUPOLE COORDINATES OF SOUTH AND EAST SIDES OF THE COLUMNS

The quadrupole coordinates, east longitude (QLE(J)) and colatitude (QCS(I)), of the east and south sides of the Column (I, J) are computed from

$$QCS(I) = QCS(I - 1) + 2 \times [QC(I) - QCS(I - 1)] \qquad I = 1, NCELX$$

$$QLE(J) = QLE(J - 1) + 2 \times [QL(J) - QLE(J - 1)] \qquad J = 1, NCELY$$

where

$$QCS(0) = QCSBOT$$

$$QLE(0) = QLEBOT \ .$$

The sines and cosines of both QCS(I) and QLE(J) (SNQCS(I), CSQCS(I), SNQLE(J), and CSQLE(J)) are also computed.

2.10 SOLID ANGLE OF COLUMN IN QUADRUPOLE COORDINATE SYSTEM

2.10.1 Background

Whereas the actual solid angle subtended by a column of cells is not needed for computing the hydrodynamics per se, there are at least two requirements for such information:

a. The actual mass in a cell is needed to compute the specific energy (erg/g) deposited by heavy particles from the loss-cone and ion-leak sources [Vol. 5, HS-75b], and

b. The mass of the event cell is required to compare the total energy put into the event cell with the total energy of the event.

2.10.2 Derivation

The element of area on a sphere formed by the quadrupole planes (α, $\alpha + d\alpha$, β, $\beta + d\beta$), as shown in Fig. 11, is a parallelogram with sides $rd\alpha$ and $rd\beta$ and with acute angle δ, given by

$$\delta = \pi - \lambda \quad ,$$

where λ is given by the law of cosines as

$$\begin{aligned}\cos \lambda &= - \cos \alpha \cos \beta + \sin \alpha \sin \beta \cos 90^\circ \\ &= - \cos \alpha \cos \beta \quad .\end{aligned}$$

Hence,

$$\cos \delta = \cos(\pi - \lambda) = - \cos \lambda = \cos \alpha \cos \beta$$

$$\sin \delta = (1 - \cos^2 \delta)^{\frac{1}{2}} = (1 - \cos^2\alpha \cos^2\beta)^{\frac{1}{2}} \quad .$$

Thus, the solid angle for quadrupole angles α_1, α_2, β_1, β_2 is

$$\Omega(\alpha_1, \alpha_2; \beta_1, \beta_2) = \int_{\alpha_1}^{\alpha_2} \int_{\beta_1}^{\beta_2} (1 - \cos^2\alpha \cos^2\beta)^{\frac{1}{2}} \, d\alpha \, d\beta \quad .$$

Since the first integration leads to elliptic integrals (of the second kind), we have resorted to the following approximation, the validity of which can be checked by numerical integrations, if necessary: Since $\alpha \approx \beta \approx \pi/2$, we know $\cos^2\alpha \cos^2\beta \ll 1$; hence

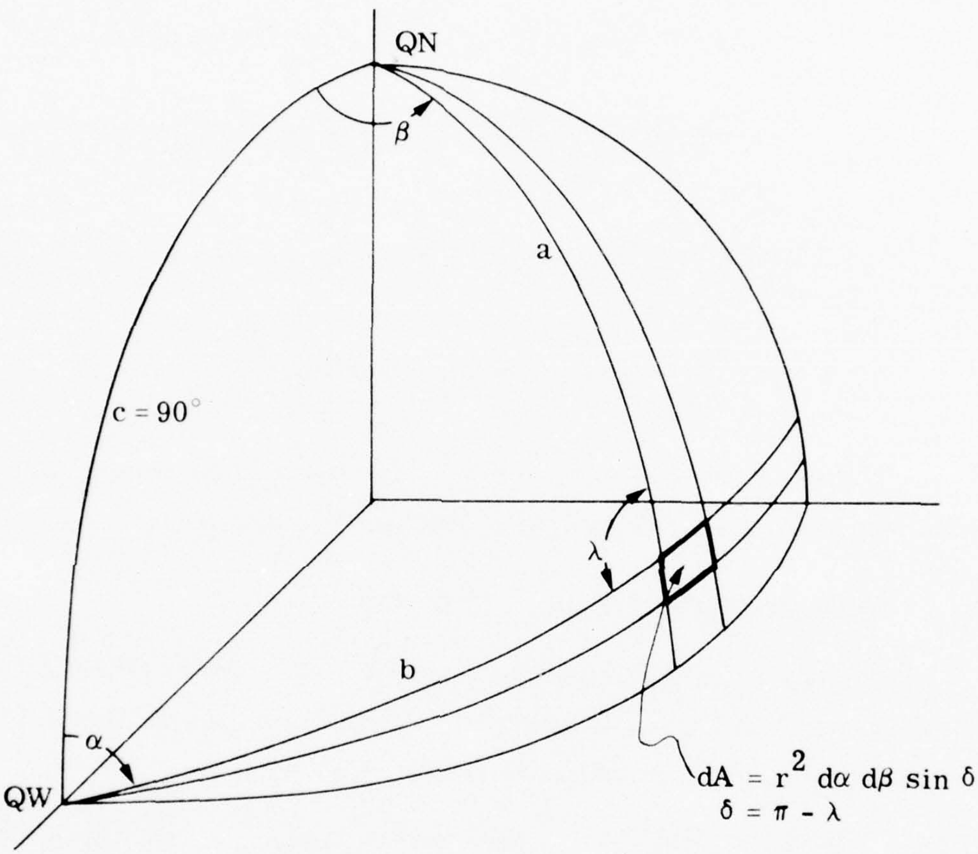


Fig. 11. Geometry Used in Computing Solid Angle of Column in Quadrupole Coordinates.

$$\Omega(\alpha_1, \alpha_2; \beta_1, \beta_2) \approx \int_{\alpha_1}^{\alpha_2} \int_{\beta_1}^{\beta_2} \left(1 - \frac{1}{2} \cos^2\alpha \cos^2\beta\right)^{\frac{1}{2}} d\alpha \, d\beta$$

$$= (\alpha_2 - \alpha_1)(\beta_2 - \beta_1) - \frac{1}{8} (\alpha_2 - \alpha_1 + \sin\alpha_2 \cos\alpha_2$$

$$- \sin\alpha_1 \cos\alpha_1)(\beta_2 - \beta_1 + \sin\beta_2 \cos\beta_2 - \sin\beta_1 \cos\beta_1)$$

$$= (\alpha_2 - \alpha_1)(\beta_2 - \beta_1) - \frac{1}{8}\left[\alpha_2 - \alpha_1 + \frac{1}{2}(\sin 2\alpha_2 - \sin 2\alpha_1)\right]$$

$$\times \left[\beta_2 - \beta_1 + \frac{1}{2}(\sin 2\beta_2 - \sin 2\beta_1)\right] \quad .$$

The solid angle of each column is computed and stored as a one-dimensional array, STR(NN), in PARAMS Common.

2.11 CELL BOUNDARIES (FOR SAIHYD)

The bottom boundary of the grid (HABOT), set by DRIVER reading Namelist SETUP1, is passed to GRIDON through PARAMS Common. The (initial) bottom boundary of Cell K is computed from

$$HB(K) = HB0(K) = HB0(K - 1) + DELHA(K - 1) \quad , \qquad K = 2, \ KMAX$$

where

$$HB0(1) = HABOT$$

$$KMAX = NCELZ + 1 \quad .$$

DELHA(K), the initial height of Cell K, is set by DRIVER reading Namelist SETUP1 and passed to GRIDON through PARAMS Common. NCELZ, the total number of cells in a column, is set by DRIVER reading Namelist SETUP1 and passed to GRIDON through PRPREG Common.

The geocentric radius of the bottom boundary of Cell K is computed from

$$R(K) = RE + HB(K) \ .$$

2.12 STERADIANAL VOLUME OF CELL (FOR SAIHYD)

The steradianal volume of Cell (K - 1) is computed from

$$VOL(K - 1) = \left\{ [R(K)]^3 - [R(K - 1)]^3 \right\} / 3 \ .$$

2.13 CELL-CENTER ALTITUDES (FOR SAIHYD)

The altitude of each cell center, including a fictitious cell-center above the top boundary, is computed from

$$HC(K - 1) = 0.5 \times [HB(K - 1) + HB(K)] \ , \qquad K = 2, KMAX$$

$$HC(KMAX) = 0.5 \times [3 \times HB(KMAX) - HB(NCELZ)] \ .$$

3. SAIHYD (DIFFERENCE-EQUATION FORM OF LAGRANGIAN HYDRODYNAMICS)

3.1 INITIALIZATION OF LAGRANGIAN CELLS IN A COLUMN UNDER AMBIENT CONDITIONS

The initialization of the Lagrangian cells in a column is started by a call from Subroutine GRIDON to Subroutine ATMOSG.

3.1.1 Velocity

The velocity of the bottom boundary of each Cell K, VEL(K), is set to zero:

$$VEL(K) = 0 \ , \qquad K = 1, \ KMAX$$

3.1.2 Viscous Pressure

The viscous pressure of each Cell K, Q(K), is set to zero:

$$Q(K) = 0 \ , \qquad K = 1, \ NCELZ$$

3.1.3 Mass

The mass per steradian of Cell K is found by a call to Subroutine SRMASS which uses the Weddle Rule to integrate the function ρR^2 between the lower and upper geocentric radii R(K) and R(K+1) for Cell K, i.e.,

$$CELM(K) = (0.3/6)\left[R(K+1) - R(K)\right] \sum_{i=1}^{7} \rho_i \ R_i^2 \ W_i$$

where W_i = 1, 5, 1, 6, 1, 5, 1. The mass density ρ_i is found at each of the seven evenly-spaced geocentric radii R_i by calls from Subroutine

SRMASS to Subroutine ATMOSU. The mass of fictitious Cell KMAX, CELM(KMAX), is arbitrarily set equal to CELM(NCELZ).

The so-called boundary mass is computed as the mean of the two adjacent cell masses, i.e.,

$$\mathrm{BDYM}(K+1) = 0.5 \times [\mathrm{CELM}(K) + \mathrm{CELM}(K+1)] \ , \qquad K = 1, \mathrm{NCELZ}$$

3.1.4 Pressure

The pressure in Cell K is computed from the hydrostatic form of the momentum equation so as to stabilize the column of cells under ambient conditions. (This procedure is patterned after that in the MRC HARC code.) We start with the ambient pressure (PAMB) at the fictitious-cell center above the top boundary, obtained by a call to ATMOSU at altitude HC(KMAX), and work downward, using the expression

$$P(K-1) = P(K) + G[R(K)] \times \mathrm{BDYM}(K)/[R(K)]^2 \ ,$$

where G[R(K)] is the acceleration due to gravity at geocentric radius R(K),

$$G[R(K)] = \mathrm{GRAVZ} \times \{\mathrm{RE}/[\mathrm{RC}(K)]\}^2 \ ,$$

and GRAVZ, the value of G at the Earth's surface, is set in Block Data BLOCKH and passed to ATMOSG through CNSTNT Common.

3.1.5 Density

The mass density of Cell K, RHO(K), is computed from

$$\mathrm{RHO}(K) = \mathrm{CELM}(K)/\mathrm{VOL}(K) \ .$$

3.1.6 Internal Energy

The specific internal energy of Cell K, EPS(K), is computed from the equation of state,

$$EPS(K) = P(K)/[RHO(K) \times GAM1] \ ,$$

where GAM1 = γ - 1 and is set to be 0.5 in Block Data BLOCKH and passed to ATMOSG through CNSTNT Common.

3.1.7 Species Densities and Other Chemistry Quantities

Species densities and other chemistry quantities are not required for the hydrodynamics but they are required for the chemistry. In general, these quantities are determined in Subroutine ATMOSG at the beginning of a loop over the cells in a column by three calls to Subroutines ATMOSU(2, HCKM), IONOSU(2, HCKM), and SPCMIN(2, HCKM), where HCKM is the altitude (in kilometers) of the cell center. We list in Table 1 the chemistry quantities and how they are initialized; this table applies to NRLHYD as well as SAIHYD.

3.2 CONTROL ROUTINE FOR ADVANCING THE HYDRODYNAMICS (SUBROUTINE HYDROG)

Subroutine HYDROG, the routine controlling the subroutines doing the actual advancement of the hydrodynamics, performs the following functions.

a. Establishes the proper headings for the two sets of time-slot data by testing on the value of the parameter (IDREG) for the number of hydro and chemistry updates. IDREG, initially set and updated in DRIVER, is passed through PRPREG Common.

b. Controls the looping over all the columns in the grid while the hydrodynamics is being done.

Table 1. Initialization of Chemistry Quantities for SAIHYD and NRLHYD.

Index M in BUF(L+M)	Quantity	Fortran Variable	Initial Value	Basis
3	T_e	TX	Formula	a
4	[e]	ENE	EFE × F[b]	c
7	$[N(^4S)]$	EN4S	SNI(7) × F	d
8	$[N(^2D)]$	EN2D	1.0	e
9	[O]	SNI(3)	SNI(3) × F	f
10	$[N_2]$	SNI(1)	SNI(1) × F	f
11	$[O_2]$	SNI(2)	SNI(2) × F	f
12	[NO]	ENO	SNI(8) × F	d
13	$[N^+]$	ENP	1.0	e
14	$[O^+]$	OP	EFOP × F	c
17	T_{N2vib}	TN2VIB	TX	g
18	$[CO_2]$	SNI(6)	SNI(6) × F	f
20	Q_{amb}	EFQ	EFQ	c
22	[He]	SNI(5)	SNI(5) × F	f
h	$[M^+]$	AMOLP	$\mathrm{Max}(1,\ e\text{-}N^+\text{-}O^+)$	i

[a] Similar to formula in Subroutine IONOSU [Vol. 14a] but with account of normalized species.

[b] F, known as FACT in code, is the factor required to normalize the species densities so that the sum of their mass densities will equal the mass density computed for the Lagrangian cell (see Section 3.1.5) for SAIHYD or for the Lagrangian point (see Section 4.1.4) for NRLHYD.

[c] Subroutine IONOSU through IONOUP Common.

[d] Subroutine SPCMIN through ATMOUP Common.

[e] Arbitrary.

[f] Subroutine ATMOSU through ATMOUP Common.

[g] TN2VIB = TX in ambient ionosphere model.

[h] Not a stored quantity for either SAIHYD or NRLHYD but is computed for information.

[i] Charge conservation.

c. Effects the transfer of the NCOL cell quantities for the column of interest from large core memory (LCM) to small core memory (SCM). This transfer is done by a call to Subroutine ECRD(BUF, IWI, NCOL), where IWI = (NN-1) × NCOL + NTIME1, so that NCOL quantities starting at index IWI in LCM are transferred to the BUF array in SCM.

d. Initializes the variables in CELLLS Common and HEIGHT Common before calling Subroutine HYDRO1. These variables for Cell K (K = 1, NCELZ) are:

$HC(K) = BUF(LOC + 1)$	Cell-center altitude
$RHO(K) = BUF(LOC + 2)$	Mass density
$VEL(K + 1) = BUF(LOC + 6)$	Upper-boundary velocity
$P(K) = BUF(LOC + 15)$	Pressure
$Q(K) = BUF(LOC + 16)$	Artificial viscous pressure
$HB0(K + 1) = BUF(LOC + 21)$	Top-boundary altitude in ambient atmosphere
$R(K + 1) = R(K) + 2 \times [RE + HC(K) - R(K)]$	Geocentric radius of top boundary
$EPS(K) = \dfrac{BUF(LOC + 15)}{BUF(LOC + 2) \times GAM1}$	Specific internal energy
$VOL(K) = \{[R(K + 1)]^3 - [R(K)]^3\}/3$	Steradianal volume
$CELM(K) = RHO(K) \times VOL(K)$	Cell mass
$CELM(KMAX) = CELM(NCELZ)$	Mass of fictitious top cell
$PKMAXZ = PKMAX(NN)$	Pressure in fictitious top cell
$BDYM(K + 1) = 0.5 \times [CELM(K) + CELM(K + 1)]$	Upper boundary mass

e. Calls Subroutine HYDRO1(TIME, TSTOP, IEXPLD) to advance the hydrodynamics in a column from the start time (TIME) to the stop time (TSTOP). A value of one for IEXPLD, set in DRIVER and passed to HYDROG as a calling argument, denotes that an event has just occurred and a value of zero denotes that an event has not just occurred. A value of one for this flag is used in Subroutine DELTIM to set a small value for the first time step. This flag was used in development and may no longer be necessary.

f. 1. Checks whether or not Column NN needs to be rezoned, based on the value of the geocentric radius of the topmost boundary relative to the criterion radius RMAX, and sets the rezone flag IREZ(NN) if required. IREZ(NN) is incremented by one if rezoning is required for Column NN, thus making its value odd. After rezone is performed in Subroutine REZONE, based on IREZ(NN) being odd, IREZ(NN) is then incremented by one in Subroutine REZONE, thus making its value even. The number of rezones already performed on Column NN can be found by dividing IREZ(NN) by two.

f. 2. Prints a message, if a rezone is required, stating the rezone number and the associated time.

g. Outputs the following hydrodynamic quantities for Column NN at time TSTOP:

1. Cell index
2. Cell-center altitude
3. Cell mass density
4. Cell-center velocity
5. Cell specific internal energy
6. Cell pressure
7. Cell artificial viscous pressure

h. Prints the quantities ETZ, ET, and FDELE from the energy check, computed in Subroutine ENECHK after being called by HYDRO1 and passed through ENERGY Common.

i. Updates the BUF array. (Compare Step d above.)

j. Effects the transfer of the NCOL cell quantities for the column of interest from SCM to LCM by a call to Entry Point ECWR(BUF, IWI, NCOL) in Subroutine ECRD.

k. Sets and prints the values of the altitudes and velocities of the time-dependent event-points by calling Subroutine TIMVAR.

3.3 HYDRODYNAMICS EQUATIONS AND TIME STEP (SUBROUTINES HYDRO1 AND DELTIM)

In SAIHYD, the basic hydrodynamics is computed in Subroutine HYDRO1, which advances the hydrodynamics in a geocentric steradianal column of cells by solving the one-dimensional Lagrangian hydrodynamics equations in a geocentric spherical coordinate system. The difference equations and their sequence of solution are patterned generally after those used by D. Sappenfield in his version of RADFLO [MRC-R-67 (generally unavailable) and computer listing kindly provided on 18 April 1974 to D. A. Hamlin], originally developed by J. Zinn [Zi-73a] of Los Alamos Scientific Laboratory. We elected this procedure in preference to using the MRC HARC-Code procedure which had undergone an obscure evolution from Sappenfield's.

The changes we have made in Sappenfield's procedures include the following:

a. The equations are solved for flow in one steradian instead of 4π steradians.

b. The acceleration due to gravity is added.

c. The time step (DT) is determined, as in the MRC HARC-code, by solving the White stability condition for DT, instead of computing the White number and changing DT according to some prescription.

d. The total artificial viscous pressure is currently taken to be a sum of the linear and quadratic viscous pressures, each weighted by multipliers EPS1 and EPS2 (read by DRIVER in Namelist SETUP1 and passed to HYDRO1 through HEIGHT Common), whereas Sappenfield uses only the linear form. We are currently using a value of 0.5 for both EPS1 and EPS2, but this topic needs more study.

In Sappenfield's equations, the velocity is not at time $t_{n+\frac{1}{2}}$, as in many or most explicit (as opposed to implicit) Lagrangian hydro codes, but is at time t_n, just as are the radius, energy, etc. In computing the new velocity, Sappenfield uses an acceleration which is so chosen that the sum of the kinetic and internal energies is conserved to second order in the time step, as we now demonstrate.

For simplicity, we consider two cells in a one-dimensional cartesian system, illustrated in Fig. 12. Assume the boundaries are at rest, i.e., $v_1 = v_3 = 0$. At the beginning and end of a time step ($\Delta t = t_{n+1} - t_n$) the kinetic energies, $KE(t_n)$ and $KE(t_{n+1})$, are

$$KE(t_n) = \frac{1}{2}\left(\frac{m_1 + m_2}{2}\right)[v_2(t_n)]^2$$

$$KE(t_{n+1}) = \frac{1}{2}\left(\frac{m_1 + m_2}{2}\right)[v_2(t_n) + \alpha\,\Delta t]^2$$

where $(m_1 + m_2)/2$ is the boundary mass and α is the acceleration. The increase in kinetic energy, ΔKE, is

$$\begin{aligned}\Delta KE &= KE(t_{n+1}) - KE(t_n)\\ &= \frac{1}{2}\left(\frac{m_1 + m_2}{2}\right)\left[2\,v_2(t_n)\,\alpha\,\Delta t + (\alpha\,\Delta t)^2\right]\\ &= \frac{1}{2}\left(\frac{m_1 + m_2}{2}\right)\left[v_2(t_n) + \frac{1}{2}\alpha\,\Delta t\right]2\alpha\,\Delta t \quad .\end{aligned}$$

The change in internal energy, ΔIE, is

$$\Delta IE = -(p_1\,\Delta V_1 + p_2\,\Delta V_2)$$

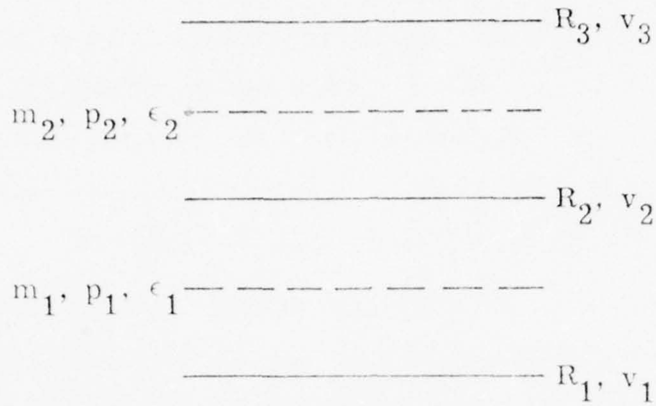


Fig. 12. Two Cells in a One-Dimensional Plane-Geometry Lagrangian Hydro Code.

where the change in volume is

$$\Delta V_1 = -\Delta V_2 = A\left[v_2(t_n) + \frac{1}{2}\alpha\,\Delta t\right]\Delta t \quad .$$

Thus the change in internal energy is

$$\begin{aligned}\Delta IE &= \Delta V_1(p_2 - p_1)\\ &= A\left[v_2(t_n) + \frac{1}{2}\alpha\,\Delta t\right]\Delta t(p_2 - p_1)\end{aligned}$$

and

$$\frac{\Delta IE}{\Delta KE} = \frac{A(p_2 - p_1)}{\left(\frac{m_1 + m_2}{2}\right)\alpha} \quad .$$

If we want ΔIE to equal ΔKE, we must use an acceleration α given by

$$\alpha = A(p_2 - p_1)/\left(\frac{m_1 + m_2}{2}\right) \ ,$$

which is the form of the acceleration used by Sappenfield.

The time step is normally determined by calling Subroutine DELTIM. Before 'deriving' the expression given in DELTIM for DT, we first recall the Courant condition for determining the stability of the difference equations of hydrodynamics. The Courant condition [RM-67, p. 298],

$$\frac{c}{DELR/DT} \leq 1 \quad ,$$

where c is the sound speed and DELR is the cell width, states [Hi-65a] that "the time step must be small enough so that a disturbance traveling at local sound speed cannot travel a full zone width, otherwise hydrodynamic disturbances can escape consideration."

George N. White, Jr., of LASL has long used a generalization of the Courant condition for determining the stability of the difference equations of hydrodynamics. His method was initially derived empirically for use in early Los Alamos codes and later derived in a memorandum, entitled "An Analysis of Lagrangian One-Dimensional Shock Hydrodynamic Difference Equation Stability by Application of Routh's Criterion," kindly provided by C. G. Davis of LASL.

This memorandum had been provided to R. D. Richtmyer, for Richtmyer and Morton [RM-67, addendum on p. 350] state that G. N. White communicated an extensively-used stability condition for the viscosity method:

$$\left(\frac{c}{\Delta X/\Delta t}\right)^2 + 4a^2 \frac{\left|V_{j+\frac{1}{2}}^{n+1} - V_{j+\frac{1}{2}}^{n}\right|}{V_{j+\frac{1}{2}}^{n}} < 1 \quad ,$$

where we have corrected a misprint in RM-67 by writing the first term as a squared quantity instead of as a first-power quantity. Here, a^2 is the dimensionless coefficient in the quadratic form of the artificial viscosity.

To show the expression we use for the time step, we start with the expression

$$\mathrm{WN} = \left(\frac{\mathrm{DT}}{\mathrm{DELR}}\right)^2 \mathrm{CS2} + 4\,\frac{\mathrm{DDTSRV} \times \mathrm{DT}}{\mathrm{DELR} \times (\mathrm{WS})^2} \tag{1}$$

where

WN = the White number, set to be 0.6 in Subroutine DELTIM.

DELR = RTOP - RBOT

WS = (RTOP + RBOT)/2

CS2 = alleged "sound-speed squared"
= 4.166 P/ρ

DDTSRV = rate of change in steradianal volume.

DDTSRV × DT = change in steradianal volume.

DELR × $(\mathrm{WS})^2$ = approximate steradianal volume.

Equation (1) is similar to Eq. (9) in G. N. White's memorandum; however, it differs in that (a) the details of computing the volume are changed, just as RM-67 altered them, (b) the sound-speed squared has the mysterious factor 4.166, unrecognized by Sappenfield, Zinn, or MRC personnel, and (c) White's a^2 has been set equal to 1. Equation (1) is very close to Sappenfield's expression for the White condition; it differs in that (a) Sappenfield's first term is only one-half as large and (b) the details of the volume computation differ.

Now, rewrite Eq. (1) as

$$1 = \left(\frac{DT}{DELR}\right)^2 \frac{CS2}{WN} + \frac{4}{WN} \frac{DDTSRV \times DT}{DELR \times (WS)^2}$$

and define

$$B = 2 \times DELR \times DDTSRV/[CS2 \times (WS)^2]$$

$$C = (DELR)^2 \; WN/CS2$$

so that

$$1 = \frac{(DT)^2}{C} + \frac{DT \times 2B}{C}$$

or

$$(DT)^2 + 2B \times DT - C = 0$$

or

$$\boxed{DT = -B + \sqrt{B^2 + C}}$$

which is the expression in Subroutine DELTIM for determining the time step.

Having the time step, we are now ready to advance the hydro equations in time, done by looping over the cells in a column in two phases. In Phase 1, we compute the total pressure in each of the cells at time t_n by adding the real pressure and artificial viscous pressure (from the previous Phase 2). The real pressure is computed by using a constant-gamma equation of state, with the mass density and specific internal energy from the previous Phase 2. Thus, the total pressure in Cell K is

$$PTOT(K) = P(K) + Q(K) \qquad K = 1, NCELZ \; .$$

Our assignment of the boundary-condition pressure at the fictitious cell center above the top boundary is an ad hoc procedure that may need improvement. Currently, this constant pressure (prior to a rezone) is taken to be the ambient pressure at the initial altitude of the fictitious cell-center above the top boundary:

$$\mathrm{PTOT(KMAX)} = \mathrm{PKMAXZ} \quad ,$$

where PKMAXZ is determined in Subroutine ATMOSG and passed to HYDRO1 through HEIGHT Common.

In Phase 2, the difference equations, applied in sequential order to each cell before moving on to the next cell, yield values for the following quantities:

a. Mean acceleration of boundary during DT.
b. Radius of boundary at time t_{n+1}.
c. Geocentric radius (and altitude) of cell boundary at time t_{n+1}.
d. Thickness of cell at time t_{n+1}.
e. Velocity of cell boundary at time t_{n+1}.
f. Steradianal volume of cell at time t_{n+1}.
g. Change in steradianal volume of cell during DT.
h. Specific internal energy of cell at time t_{n+1}.
i. Mass density of cell at time t_{n+1}.
j. Artificial viscous pressure of cell at time t_{n+1}.

We let K = 1 denote the lowest boundary and lowest cell, and K1 = K - 1. Then the equations are:

<u>Acceleration:</u>

$$\mathrm{ACC} = [\mathrm{PTOT(K1)} - \mathrm{PTOT(K)}] \times \left\{ \frac{[\mathrm{R(K)}]^2 + \mathrm{DT} \times \mathrm{R(K)} \times \mathrm{VEL(K)}}{\mathrm{BDYM(K)}} \right\} - \mathrm{G}[\mathrm{R(K)}]$$

where

$$G(A) = GRAVZ \times (RE/A)^2$$

Radius:

$$R(K) = R(K) + [VEL(K) + 0.5 \times ACC \times DT] \times DT$$

Altitude:

Boundary:

$$HB(K) = R(K) - RE$$

Cell Center:

$$HC(K1) = 0.5 \times [HB(K) + HB(K1)]$$

Cell Thickness:

$$DR = R(K) - R(K1)$$

Velocity:

$$VEL(K) = VEL(K) + ACC \times DT$$

Volume of Cell K1:

$$VOLUME = \{[R(K)]^3 - [R(K1)]^3\}/3$$

Volume Change of Cell K1 in DT:

$$DVOL = VOLUME - VOL(K1)$$

Store Volume of Cell K1:

$$VOL(K1) = VOLUME$$

Internal Energy of Cell K1:

$$EPS(K1) = EPS(K1) - \frac{PTOT(K1) \times DVOL}{CELM(K1)}$$

Density:

$$RHO(K1) = \frac{CELM(K1)}{VOL(K1)}$$

Artificial Viscous Pressure:

$$Q(K1) = \begin{cases} EPS1 \times Q1 + EPS2 \times Q2 \ , & DVOL < 0 \\ 0 \ , & DVOL \geq 0 \end{cases}$$

where the linear and quadratic viscous pressures are

$$Q1 = - [1.67 \times PTOT(K1) \times RHO(K1)]^{\frac{1}{2}} \times 0.4 \times DDDV$$

$$Q2 = 0.4 \times RHO(K1) \times (DDDV)^2$$

$$DDDV = DVOL \times DR/[DT \times VOL(K1)]$$

Real Pressure:

$$P(K1) = GAM1 \times RHO(K1) \times EPS(K1)$$

3.4 ENERGY CHECK (SUBROUTINE ENECHK)

We have provided an energy check for the SAIHYD, to be used at least during the development stages of the code. Such a check is made in Subroutine ENECHK. This routine is called to perform one of two types of calculations: (1) To compute the total energy (ETZ) in a column, consisting of internal and kinetic energy, regarded as the reference energy for comparison purposes and (2) To compute the current total energy (ET) in a column, consisting of not only the current internal and kinetic energies but also the total work done by the column since the reference energy (ETZ) was last computed and updated (in Subroutine CHEMG) by the return of energy from the chemistry routines. The total

work done consists of (a) work against gravity and (b) work by the top cell against the downward-acting backpressure. After ET is computed, the fractional change in the total energy (FDELE) is computed,

$$\mathrm{FDELE} = (\mathrm{ET} - \mathrm{ETZ})/\mathrm{ETZ} \ .$$

The formulas used are, for K = 1, NCELZ:

Internal Energy:

$$\mathrm{EI} = \sum_{K} \left[\mathrm{EPS(K)} \times \mathrm{CELM(K)}\right]$$

Kinetic Energy:

$$\mathrm{EK} = 0.5 \times \sum_{K} \mathrm{BDYM(K{+}1)} \times \left[\mathrm{VEL(K{+}1)}\right]^2$$

Work Against Gravity:

$$\mathrm{EG} = \mathrm{GZREZ} \times \sum_{K} \mathrm{CELM(K)} \times \left\{ \frac{1}{\mathrm{RE} + 0.5\left[(\mathrm{HB0(K)} + \mathrm{HB0(K{+}1)}\right.} - \frac{1}{\mathrm{RE} + \mathrm{HC(K)}} \right\}$$

Work Against Backpressure:

$$\mathrm{EW} = \mathrm{PKMAXZ} \times \left[(\mathrm{RCKMX})^3 - (\mathrm{RCKMXZ})^3\right]/3$$

where

EPS(K) = specific internal energy (erg/g)

CELM(K) = cell steradianal mass (erg/sr)

BDYM(K) = boundary mass (g/sr)

VEL(K) = boundary velocity (cm/sec)

GZREZ = $g_o\ (\mathrm{RE})^2\ (\mathrm{cm}^3/\mathrm{sec}^2)$

PKMAXZ = constant backpressure $(\mathrm{dyne/cm}^2)$

$$RCKMX = RE + HC(KMAX)$$

$$RCKMXZ = RE + HCKMXZ$$

$$HCKMXZ = 0.5 \times [3 \times HB0(KMAX) - HB0(NCELZ)]$$

A zero (or unit) value for an index flag (IENCHK), read by DRIVER with Namelist SETUP1 and passed through LINK Common, is used to bypass (or permit) the use of Subroutine ENECHK. Within Subroutine ENECHK, a zero value for the hydro-cycle counter in Column 1 (KCYC(1)) allows ETZ to be computed and a nonzero value allows ET to be computed.

Subroutine ENECHK computes ETZ upon calls from (a) DRIVER if ambient conditions are being evaluated or if energy has been deposited for an event and (b) Subroutine REZONE after the column has been rezoned. Subroutine ENECHK computes ET upon a call from Subroutine HYDRO1 at the end of a hydro update interval.

3.5 REZONE (SUBROUTINE REZONE)

3.5.1 Purpose

To provide for maintaining a reasonable cell resolution in the (more important) lower portion of the HAG as a column expands to very high altitude, we have developed Subroutine REZONE.

3.5.2 General Features of Subroutine REZONE

Subroutine REZONE resets the boundaries and properties of the cells for those columns whose geocentric radius of the uppermost boundary exceeds a given geocentric radius RMAX at the hydro-advance time TSTOP. The number of cells in a rezoned column is kept the same (NCELZ). The new cell thicknesses (DELHA2(K)) are read by DRIVER in Namelist SETUP1 and passed through REZONN Common. If

DELHA2(1) = 0., the rezoned thicknesses are set equal to the original cell thicknesses (DELHA(K)) set in DRIVER by a Data Statement. Table 2 gives the currently-used values for the initial and rezoned cell thicknesses and altitudes.

In our original version of Subroutine REZONE, we used the principles of conservation of mass, momentum, and energy to derive the rezoned quantities. This version usually worked well, but we sometimes had (1) a negative internal energy, presumably due to the coarseness of the cell structure, and (2) one or more new boundaries with zero velocity, if the lowest old cell expanded so much that its center became higher than the upper boundary of one or more new boundary-cells. Failing to find any coding errors, we reluctantly gave up the principles of momentum and energy conservation and resorted to linear interpolation to find the new velocities and logarithmic interpolation to find the new pressures. However, we have retained conservation of mass within the boundaries of each new cell and a similar conservation of the total electron thermal and excitation energy.

Subroutine REZONE is called from DRIVER after all columns have been advanced first for hydrodynamics and then for chemistry. In looping over the columns, Subroutine REZONE rezones only those columns for which a rezone flag (IREZ(NN)) has been set (based on the rezone criterion) in Subroutine HYDROG immediately after Subroutine HYDRO1 completes the hydrodynamics for Column NN.

If the rezone flag has been set for Column NN, then Subroutine ECRD is called to obtain the column quantities from Time-Slot 2. For development purposes we print the status of the Lagrangian-cell quantities, and also the molecular-ion density and heavy-particle temperature, before rezone. After the new cell quantities are determined, Entry Point

Table 2. Nominal Values for the Initial and Rezoned Cell Thicknesses and Altitudes in SAIHYD.

Cell Index, K	Before Rezone			After Rezone		
	Cell Thickness, km[a]	Altitude Cell Center, km	Altitude Cell Top, km	Cell Thickness, km	Altitude Cell Center, km	Altitude Cell Top, km
			90.0[b]			90.0[b]
1	7.0	93.5	97.0	10.0	95.0	100.0
2	6.0	100.0	103.0	15.0	107.5	115.0
3	6.5	106.25	109.5	20.0	125.0	135.0
4	7.5	113.25	117.0	25.0	147.5	160.0
5	8.0	121.0	125.0	30.0	175.0	190.0
6	9.0	129.5	135.0	35.0	207.5	225.0
7	13.0	140.5	147.0	40.0	245.0	265.0
8	16.0	155.0	163.0	50.0	290.0	315.0
9	26.0	176.0	189.0	60.0	345.0	375.0
10	36.0	207.0	225.0	70.0	410.0	445.0
11	52.0	251.0	277.0	80.0	485.0	525.0
12	70.0	312.0	347.0	90.0	570.0	615.0
13	100.0[c]	397.0	447.0	100.0[c]	665.0	715.0

[a] The code uses centimeters instead of kilometers.

[b] Bottom of grid for energy deposition purposes.

[c] Nominal thickness for additional cells is 100 km.

ECWR in Subroutine ECRD is called to store the cell quantities in Time-Slot 2. Again, for development purposes, we print the rezoned cell properties, including the molecular-ion density and heavy-particle temperature.

3.5.3 Altitude in Ambient Atmosphere Corresponding to New Cell Locations

One of the needed properties of a cell is the altitude (HB0(K)) in the ambient atmosphere corresponding to the lower boundary of the cell. Such information is used by Subroutine ENECHK in computing the work done against gravity since the start of the problem or since the last rezone. Subroutine REZONE uses linear interpolation between the appropriate pairs of the old values of these ambient-atmosphere altitudes to obtain the new values.

3.5.4 Conservation of Mass, Species, and Ion-Production Rate

To facilitate implementation of the conservation laws, we developed Subroutine FRCVOL, called from Subroutine REZONE, to compute the (absolute) fractional volumes (DVOL(NI)) of a new cell sliced by old-cell boundaries. In this way, e.g., the total mass of a new cell is equal to the sum of the products of the mass density and fractional volume for the old cells overlapping or contained within a new cell. The density in the new cell is obtained by dividing its total mass by its total volume.

A similar procedure is followed for each density-dependent quantity, e.g., the species number densities and the effective ambient ion production rate.

3.5.5 Conservation of Sum of Electron Thermal and Excitation Energies

To compute the new value for the temperature taken to be the common value for the electrons, N_2 vibrational levels, and the $O(^1D)$-to-$O(^3P)$ population ratio, we conserve the sum of the electron thermal energy and the excitation energy for $O(^1D)$ and N_2 vibration. In computing this excitation energy we use the same parameters as used in the GET-developed Subroutine TEXK [KJ-74, KJ-74b]. After the amount of energy per unit volume available for partitioning among the three modes is known, as well as the densities of N_2 molecules, O atoms, and electrons, Subroutine TEXK is called from REZONE to return the temperature common to the three modes.

3.5.6 Velocity Interpolation

The velocity of a new cell boundary is found by linearly interpolating between the velocities of the two bracketing old boundaries.

3.5.7 Pressure Interpolation

The pressure of a new cell, assumed to be specified at the center of the cell, is found by linearly interpolating between the logarithms of the pressures at the two bracketing old-cell centers. In this procedure, the pressure (PKMAX(NN)) in the fictitious cell at the top of the column is determined in the same way.

3.5.8 Artificial Viscous Pressure

In HYDRO1 we compute the artificial viscosity from

$$Q(K1) = EPS1 \times Q1 + EPS2 \times Q2 \qquad (2)$$

where

$$Q1 = - SQRT(1.67 \times PTOT(K1) \times RHO(K1)) \times WB \times DDDV \qquad (3)$$

$$Q2 = WB \times RHO(K1) \times DDDV \times DDDV \tag{4}$$

$$PTOT(K) = P(K) + Q(K) \tag{5}$$

$$WB = 0.4 \tag{6}$$

$$DDDV = DVOL \times DR/(DT \times VOL(K1)) \tag{7}$$

$$DVOL = (\text{Volume})_{new} - (\text{Volume})_{old} \; . \tag{8}$$

There are two difficulties in computing Q upon a rezone:

1. How to compute DDDV?
2. How to handle PTOT (since it depends on Q)?

These difficulties have been overcome:

1. To handle DDDV, we replace DVOL/DT in (7) by

$$DVDT_i = R_i^2 \times U_i - R_{i-1}^2 \, U_{i-1} \; , \tag{9}$$

so that

$$\boxed{DDDV = DVDT \times DR/VOL(K1)} \tag{10}$$

(with the proper attention paid to indices) in both Q_1 and Q_2.

2. To handle PTOT and Q_1, we write (3) as

$$Q_1 = -\sqrt{1.67 \, P_{tot} \, \rho} \times WB \times DDDV \tag{11}$$

$$= -\sqrt{1.67(P + \epsilon_1 Q_1 + \epsilon_2 Q_2) \, \rho} \;\; WB \times DDDV \tag{12}$$

$$\left(\frac{Q_1}{WB \times DDDV}\right)^2 = 1.67(P + \epsilon_1 Q_1 + \epsilon_2 Q_2)\,\rho \qquad (13)$$

or

$$\frac{1}{(WB \times DDDV)^2}\, Q_1^2 - 1.67\rho\,\epsilon_1 Q_1 - 1.67(P + \epsilon_2 Q_2)\rho = 0 \qquad (14)$$

so that

$$\boxed{Q_1 = \frac{1.67\rho\,\epsilon_1 + \sqrt{(1.67\rho\,\epsilon_1)^2 + \dfrac{4 \times 1.67\rho(P + \epsilon_2 Q_2)}{(WB \times DDDV)^2}}}{2/(WB \times DDDV)^2}} \qquad (15)$$

where the negative-sign solution is discarded because Q_1 must be positive.

Thus, we should first compute Q_2 from (4) in which DDDV is given by (10), then compute Q_1 from (15), and finally Q from (2).

3.5.9 Initial Total Energy After Rezone

If the rezone flag (IENCHK) equals 1, Subroutine REZONE calls Subroutine ENECHK to compute a new value for the total energy in the rezoned column.

3.5.10 Resetting Vertical-Direction Indices of Time-Dependent Event Points

After the basic portion of the rezoning has been completed, the index (KX(L)) for the cell, if any, containing the event-point L is computed, as well as the fractional-distance location (FRC(L)) within the

cell. These quantities, KX(L) and FRC(L), are passed through EVENTX Common. If the point of interest is above the rezoned column, a message to that effect is printed.

3.5.11 Hydro Cycle Counters

At the end of Subroutine REZONE, provided at least one column has been rezoned, the status of the hydro cycle counters (KCYC(NN)) is printed and then the counters are zeroed.

3.6 VERTICAL MOTION OF A POINT (SUBROUTINE TIMVAR)

To meet the needs of PDI, in their overlay fireball model, to follow the motion of a specified Lagrangian point (in particular, an event-related point), we developed Subroutine TIMVAR. This routine computes the time-dependent position of a Point X and its corresponding velocity at the evaluation time. In application, we have followed only the event points, but the program could be easily modified to follow the motion of any desired points, e.g., the positions of selected debris locations.

As input, Subroutine TIMVAR needs the three indices (IX, JX, KX) of the cell containing the point to be followed and the fractional vertical-position (FRC) of the point within the cell. The quantities KX and FRC are reset at rezone. The position and velocity of the point at an evaluation time are linearly interpolated from the positions and velocities of the boundaries of the cell containing the specified point.

4. NRLHYD (DIFFERENTIAL-QUADRATURE FORM OF LAGRANGIAN HYDRODYNAMICS)

4.1 INITIALIZATION OF LAGRANGIAN POINTS IN A COLUMN UNDER AMBIENT CONDITIONS

The initialization of the Lagrangian points in a column is started by a call from Subroutine GRIDON to (the NRLHYD form of) Subroutine ATMOSG.

4.1.1 Lagrangian-Point Altitude

We have placed a NRLHYD Lagrangian point at the center of each of the SAIHYD cells plus a (permanently) stationary point at the bottom boundary (HABOT) of the SAIHYD column of cells. Thus, we must reset the value of NCELZ used in SAIHYD according to the expression

$$(\mathrm{NCELZ})_{\mathrm{NRLHYD}} = (\mathrm{NCELZ})_{\mathrm{SAIHYD}} + 1 \quad .$$

To provide for 'cell boundaries' that can be used for energy-deposition purposes in NRLHYD, we reset the value of HABOT used in SAIHYD according to the expression

$$(\mathrm{HABOT})_{\mathrm{NRLHYD}} = (\mathrm{HABOT})_{\mathrm{SAIHYD}} - 0.25 \times \mathrm{DELHA}(1) \quad .$$

4.1.2 Lagrangian-Point Velocity

The velocity of each of the Lagrangian points is set to zero.

4.1.3 Lagrangian-Point Pressure

The pressure at each of the Lagrangian points is set by the value of the ambient pressure (PAMB) passed through ATMOUP Common by a call to Subroutine ATMOSU(2, HCKM), with HCKM the altitude of the Lagrangian point.

4.1.4 Lagrangian-Point Density

The mass density at each of the Lagrangian points is set by the value of the ambient density (RHOAMB) passed through ATMOUP Common by the call to Subroutine ATMOSU(2, HCKM).

4.1.5 Lagrangian-Point Species Densities and Other Chemistry Quantities

Species densities and other chemistry quantities are not required for the hydrodynamics but they are for the chemistry. In general, these quantities are determined in Subroutine ATMOSG at the beginning of a loop over the cells in a column by three calls to Subroutine ATMOSU(2, HCKM), IONOSU(2, HCKM), and SPCMIN(2, HCKM), where HCKM is the altitude (in kilometers) of the Lagrangian point. We list in Table 1 (in Section 3.1.7) the chemistry quantities and how they are determined.

4.1.6 Weighting Factors for Local Truncation Error in NRLHYD Integrator

Weighting factors, called HEVEPS(K) in Subroutine ATMOSG, are set for estimating local truncation errors in the NRLHYD integrator (Subroutine RKAM2G), where they are called AUX(K, 6). For integrating the acceleration to obtain the velocity, the weighting factors are

$$\mathrm{HEVEPS(K)} = \frac{100}{101}\,\frac{1}{\mathrm{NCELZ}} \quad .$$

For integrating the velocity to obtain the radius, the weighting factors are

$$\mathrm{HEVEPS(K)} = \frac{1}{101}\,\frac{1}{\mathrm{NCELZ}} \quad .$$

4.2 CONTROL ROUTINE FOR ADVANCING THE HYDRODYNAMICS (SUBROUTINE HYDROG)

Subroutine HYDROG, the routine controlling the subroutines doing the actual advancement of the hydrodynamics, performs the following functions:

a. Establishes the proper headings for the two sets of time-slot data by testing on the value of the parameter (IDREG) for the number of hydro and chemistry updates. IDREG, initially set and updated in DRIVER, is passed through PRPREG Common.

b. Controls the looping over all the columns in the grid while the hydrodynamics is being done.

c. Zeroes the emergency-rezone flag (IEMREZ).

d. Effects the transfer of the NCOL Lagrangian-point quantities for the column of interest from large core memory (LCM) to small core memory (SCM). This transfer is done by a call to Subroutine ECRD(BUF, IWI, NCOL), where

$$\mathrm{IWI} = (\mathrm{NN} - 1) \times \mathrm{NCOL} + \mathrm{NTIME1} \quad ,$$

so that NCOL quantities starting at index IWI in LCM are transferred to the BUF array in SCM.

e. 1. Initializes the following variables before calling Subroutine INLHVE which initializes the variables for the NRLHYD integrator (Subroutine RKAM2G):

Geocentric radius of Lagrangian-point K:

$$\mathrm{Y(N + K)} = \mathrm{BUF(LOC + 1) + RE}$$

$$\mathrm{ZZ(K)} = \mathrm{Y(N + K)}$$

Velocity of Lagrangian-point K:

$$\mathrm{V(K)} = \mathrm{BUF(LOC + 5)}$$

Weighting factors used for local truncation error in Subroutine RKAM2G:

HEVTEM(K) = HEVEPS(K)

HEVTEM(N + K) = HEVEPS(N + K)

Mass density of Lagrangian-point K:

RHO0(K) = BUF(LOC + 2)

Pressure at Lagrangian-point K:

P0(K) = BUF(LOC + 15)

e. 2. Calls Subroutine INLHVE to initialize the differential quadrature variables for the column of interest.

f. Calls Subroutine RKAM2G to advance the hydrodynamics in a column from the start time (TIME) to the stop time (TSTOP).

g. 1. Provides a procedure for an emergency rezone of the column, in an attempt to keep the problem running after 11 halvings of the time step in Subroutine RKAM2G, indicated by IHLF = 11, fail to enable the integrator to achieve the desired accuracy.

g. 2. Prints a message if one emergency rezone is insufficient for Subroutine RKAM2G to achieve the desired accuracy.

h. 1. Checks whether or not Column NN needs to be rezoned, based on the value of the geocentric radius of the topmost Lagrangian point relative to the criterion radius (HGTMAX), and sets the rezone flag (IREZ(NN)) if required. IREZ(NN) is incremented by one if rezoning is required for Column NN, thus making its value odd. After rezone is performed in Subroutine REZONE, based on IREZ(NN) being odd, IREZ(NN) is then incremented by one in Subroutine REZONE, thus making its value even. The number of rezones already performed on Column NN can be found by dividing IREZ by two.

h. 2. Prints a message, if a rezone is required, and states the rezone number and the associated time.

i. Outputs the following hydrodynamics quantities for each of the Lagrangian points in Column NN at time TSTOP:

(1) Index
(2) Altitude
(3) Mass density
(4) Velocity
(5) Ratio of current density to initial density
(6) Specific internal energy
(7) Pressure

j. Updates the BUF array (compare Step e. 1 above).

k. Effects the transfer of the NCOL Lagrangian-point quantities for the column of interest from SCM to LCM by a call to Entry Point ECWR(BUF, IWI, NCOL) in Subroutine ECRD.

l. Sets and prints the values of the altitudes and velocities of the time-dependent event points by calling Subroutine TIMVAR.

4.3 INITIALIZATION ROUTINE FOR NRLHYD (SUBROUTINE INLHVE)

Subroutine INLHVE initializes the variables in the differential-quadrature treatment of the Lagrangian hydrodynamics by computing at each of the Lagrangian points in the column the initial values of

a. The density ratio, RRO(K) = 1.

b. The pressure-to-density ratio, CSQ0(K) = P0(K)/RHO0(K).

c. The (negative) logarithmic pressure derivative,

$$\mathrm{DPDZ0(K)} = -\sum_{L=1}^{N} \mathrm{COEF(K, L)} \times \ln[\mathrm{P0(L)}] \quad ,$$

where COEF(K, L) is the array of coefficients in the Lagrange differentiation formula, set by a call from

Subroutine INLHVE to Subroutine SETFUN and passed through VAR1 Common.

4.4 ROUTINE FOR LAGRANGE-DIFFERENTIATION-FORMULA COEFFICIENTS (SUBROUTINE SETFUN)

Subroutine SETFUN(M) computes the coefficients COEF(I, J) in the Lagrange differentiation formula, where M is the maximum number of points used in calculating the coefficients. A value of five for M is used for the third and higher-number of points from either end of the column of points. For the second point from an end, a three-point formula is used. For an end point, a one-sided two-point formula is used. The coefficients in Row I of the COEF(I, J) array are used to calculate the derivative of a function at Lagrangian-point I in the column.

The Lagrange interpolation formula for a polynomial of degree m-1 [AS-64, p. 878] is

$$f(x) = \sum_{j=1}^{m} c_j(x)\, f(x_j)$$

where

$$c_j(x) = \frac{\pi_m(x)}{(x - x_j)\,\pi'_m(x_j)}$$

$$= \frac{(x - x_1)\ \ldots\ (x - x_{j-1})(x - x_{j+1})\ \ldots\ (x - x_m)}{(x_j - x_1)\ \ldots\ (x_j - x_{j-1})(x_j - x_{j+1})\ \ldots\ (x_j - x_m)}$$

$$= \frac{\prod_{k=1}^{m}{}' (x - x_k)}{\prod_{k=1}^{m}{}' (x_j - x_k)} , \qquad k \neq j \ .$$

The Lagrange differentiation formula [AS-64, p. 882], obtained by differentiating the Lagrange interpolation formula, is

$$\frac{df}{dx} \equiv f'(x) = \sum_{j=1}^{m} c_j'(x)\, f(x_j) \quad ,$$

where

$$c_j'(x) = \sum_{\substack{\ell=1 \\ i\neq j}}^{m}{}' \frac{\prod\limits_{\substack{k=1 \\ k\neq j}}^{m}{}' (x - x_k)}{(x - x_\ell) \prod\limits_{\substack{k=1 \\ k\neq j}}^{m}{}' (x_j - x_k)} \quad .$$

Now let $x \rightarrow x_i$, a special case needed in NRLHYD:

$$\alpha_{ij} \equiv c_j'(x_i) = \sum_{\substack{\ell=1 \\ \ell\neq j \\ \ell\neq i}}^{m}{}'' \frac{\prod\limits_{\substack{k=1 \\ k\neq j}}^{m}{}' (x_i - x_k)}{(x_i - x_\ell) \prod\limits_{\substack{k=1 \\ k\neq j}}^{m}{}' (x_j - x_k)} \quad .$$

This formula is given by Gardner [Ga-74b, GP-74, GP-75] in the following form:

$$\alpha_{ij} = \sum_{\ell\neq j}^{m}{}' \left\{ \frac{1}{x_j - x_\ell} \left[\delta_{ij} + \frac{\prod\limits_{\substack{k=1 \\ k\neq j\neq \ell}}^{m}{}'' (x_i - x_k)}{\prod\limits_{\substack{k=1 \\ k\neq j\neq \ell}}^{m}{}'' (x_j - x_k)} \delta_{i\ell} \right] \right\} \quad .$$

The coefficient α_{ij} is called COEF(I, J) in Subroutine SETFUN.

4.5 INTEGRATOR FOR THE NRLHYD DIFFERENTIAL EQUATIONS (SUBROUTINE RKAM2G)

Subroutine RKAM2G evaluates the velocity and location of the Lagrangian points in a column. The integration in time is performed by using a Hamming-type modification [LS-71c, p. 155] to the Adams-Bashforth two-step second-order predictor equation [LS-71c, p. 180, Table 4.1 (A-B, k=2)] and the Adams-Moulton one-step second-order corrector equation [LS-71c, p. 180, Table 4.1 (A-M, k=1)], which results in an overall modified predictor-corrector procedure of third order [LS-71c, p. 157]. The required two-step starting values for the modified predictor-corrector scheme are obtained from a second-order Runge-Kutta method [LS-71c, p. 41, Eq. (2.1-11)], supplemented by a corrector calculation.

Subroutine RKAM2G, originally prepared by NRL, has been modified by SAI in the following principal respects:

a. Reduction of the value for the time step (PRMT(3)), set as a Data Statement in DRIVER, from 10 sec used in NRLHV4 to 1 sec used in earlier versions, as found necessary by SAI in several test problems to avoid having the Runge-Kutta portion of RKAM2G abort due to negative numbers being raised to powers in Subroutine FUNCT.

b. Removal of the constraint on the modified-predictor-corrector portion of RKAM2G that it could not double the time step with respect to PRMT(3).

c. 1. Removal of the tacit constraint, for proper working, that the time interval from the start-time to the stop-time was exactly divisible by the time step.

c. 2. Addition of the capability to interpolate to obtain the values of the velocity (Y(K)) and position (Y(N+K)) at the stop-time (X=PRMT(2)) when the integrator oversteps the specified stopping time.

d. Reduction of the value for the bound on the truncation error (EPSSET = PRMT(4)), set as a Data Statement in DRIVER, from 1000 cm used in NRLHV4 to 100 cm used in earlier versions, to help prevent aborting.

e. Addition of a hydro-cycle counter.

f. Elimination of the capability to integrate backwards in time.

g. Addition of a test in Subroutine HYDROG to detect when Subroutine RKAM2G, in either the RK or AM2G portion of the routine, fails to achieve the desired integration accuracy after 11 halvings of the time step and returns clandestinely to Subroutine HYDROG. In such a circumstance, after the proper saving and resetting of rezone flags, Subroutine HYDROG calls Subroutine REZONE to perform an emergency rezone on the column to help relieve the awkward conditions facing the integrator. In this rezone the top and bottom Lagrangian points are kept fixed and the interior points are uniformly spaced. To achieve the emergency rezone, a proper shuffling of the column data is made to Time-Slot 2 for starting the rezone and back to Time-Slot 1 after the rezone for later use by the chemistry routines. Subroutine RKAM2G is then permitted to integrate for the column. Only one such rezone at a given time is potentially useful, so an exit is called if the program attempts to repeat such an emergency rezone.

h. Revision, and extensive addition, of comment cards.

4.6 DIFFERENTIAL EQUATIONS FOR HYDRODYNAMICS IN NRLHYD (THE DERIVATIVE ROUTINE, SUBROUTINE FUNCT)

Subroutine FUNCT computes the derivatives (the velocity and acceleration at the Lagrangian points) for the ordinary differential equations (for the position and velocity at the Lagrangian points) integrated in Subroutine RKAM2G. The ordinary differential equations have been obtained [Ga-74a, Ga-74b, GP-74, GP-75] from the partial differential equations of hydrodynamics by assuming isentropic (shock-free) flow and

by replacing the partial derivatives in the spatial direction by derivatives of an analytic fit function, in accordance with the method of differential quadrature [BK-72b]. As a result of these assumptions, the acceleration at a Lagrangian point can be expressed in terms of

a. The initial values of
   (1) The pressure-to-density ratio at the point and
   (2) The logarithmic pressure derivative at the point and

b. The current values of
   (1) The ratio of the current Lagrangian geocentric radius to the initial Lagrangian geocentric radius,
   (2) The ratio of the current density at the point to the initial density at the point, and
   (3) The first and second (ordinary) derivatives of the current Lagrangian geocentric radii with respect to the initial Lagrangian geocentric radii, evaluated by differentiating polynomial fit functions for the current Lagrangian geocentric radii.

The equations of motion in NRLHYD, as written by Gardner [Ga-74b, GP-74, GP-75] in a form requiring only the initial pressure, density, and velocity at the initial fluid element locations, are

$$\frac{\partial R(r,t)}{\partial t} = v(r,t)$$

$$\frac{\partial v(r,t)}{\partial t} = -\frac{p_o(r)}{\rho_o(r)}\left[\frac{R(r,t)}{r}\right]^{2(1-\gamma)}\left[\frac{\partial R(r,t)}{\partial r}\right]^{-\gamma}$$

$$\times\left(\frac{\partial[\ln p_o(r)]}{\partial r} - \gamma\left[\frac{\partial R(r,t)}{\partial r}\right]^{-1}\frac{\partial^2 R(r,t)}{\partial r^2} - \frac{2\gamma}{r}\left\{\left[\frac{R(r,t)}{r}\right]^{-1}\frac{\partial R(r,t)}{\partial r} - 1\right\}\right) - g$$

where

r = initial geocentric radius of Lagrangian-point K.

$R(r,t)$ = current geocentric radius of Lagrangian-point K.

$v(r,t)$ = current velocity of Lagrangian-point K.

$\frac{\partial v(r,t)}{\partial t}$ = current acceleration of Lagrangian-point K.

$p_0(r)$ = initial pressure at Lagrangian-point K.

$\rho_0(r)$ = initial density at Lagrangian-point K.

The correspondence between these variables and the Fortran variables is given in Table 3, where we have also given the expressions used to evaluate the variables; of particular importance is the evaluation of the spatial derivatives by use of the polynomial fit functions, in accordance with the *differential-quadrature method.*

In terms of the Fortran variables, the equations of motion would be expressed as follows:

$$\mathrm{DERY(N + K) = Y(K)}$$

$$\mathrm{DERY(K) = CSQ0(K)} \times \frac{\left[\mathrm{RRO(K)}\right]^{\mathrm{GAMMA}}}{(\mathrm{A3})^2} \left\{ \mathrm{DPDZ0(K)} \right.$$

$$\left. + \mathrm{GAMMA} \times \left[\mathrm{A2} \times \mathrm{A1} + \frac{2}{\mathrm{ZZ(K)}} \left(\frac{\mathrm{A3}}{\mathrm{A2}} - 1 \right) \right] \right\} - \mathrm{GRAV} \quad .$$

However, in the NRL Subroutine FUNCT, there are two departures from the description in GP-74 and GP-75. First, the first and second derivatives of the Lagrangian positions (for interior points) are computed from a weighted-average procedure. In addition to the derivatives computed by use of the polynomial fit-functions mentioned above,

Table 3. Correspondence Between Text and Fortran Variables for NRLHYD Equations of Motion.

Symbol in Text [GP-75]	Fortran Variable in Subroutine FUNCT	Description of Quantity Pertaining to Lagrangian-Point K
r	ZZ(K)	Initial geocentric radius
R	Y(N+K)	Current geocentric radius
$v(r,t)$	Y(K)	Current velocity
$\partial v(r,t)/\partial t$	DERY(K)	Current acceleration
$\partial R(r,t)/\partial t$	DERY(N+K)	Current velocity
r/R	A3	= ZZ(K)/Y(N+K); ratio of initial- to current-radius
$\partial R(r,t)/\partial r$	RR(K)	$= \sum_L$ COEF(K, L) × Y(N+L); first derivative of new- with respect to old-positions; = $(A2)^{-1}$, except for limiting compression.
$\partial^2 R(r,t)/\partial r^2$	A1	$= \sum_L$ COEF(K, L) × RR(L) ; Second derivative of new- with respect to old-positions.
ρ/ρ_o	RRO(K)	= $(A3)^2 \times A2$; ratio of current- to initial-density.
$\partial[\ln p_o(r)]/\partial r$	-DPDZ0(K)	$= \sum_L$ COEF(K, L) × $\ln[p_o(L)]$; Logarithmic derivative of initial pressure.
$p_o(r)/\rho_o(r)$	CSQ0(K)	= P0(K)/RHO0(K); Initial pressure-to-density ratio.
γ	GAMMA	= 1.5; Ratio of specific heats.
g	GRAV	= GZREZ/$[Y(N+K)]^2$; Acceleration due to gravity.

derivatives are also computed by taking first and second differences. The contribution of the direct-difference derivative to the derivative ultimately used depends on a weighting factor (CHI) so chosen that it is unity at the starting time and for any compression and decreases from unity as expansion occurs.

Thus, NRL has introduced the following quantities:

$$A2 = 1/\mathrm{Max}[RR(K),\ 0.25]$$

$$CHI = \mathrm{Min}\left\{1,\ \mathrm{Max}\left[\left(\frac{ZZ(K+1) - ZZ(K)}{Y(N+K+1) - Y(N+K)}\right)^2,\ \left(\frac{ZZ(K) - ZZ(K-1)}{Y(N+K) - Y(N+K-1)}\right)^2\right]\right\}$$

$$A4 = \frac{1}{2}\left[\frac{ZZ(K+1) - ZZ(K)}{Y(N+K+1) - Y(N+K)} + \frac{ZZ(K) - ZZ(K-1)}{Y(N+K) - Y(N+K-1)}\right]$$

$$A2 = (1 - CHI) \times A2 + CHI \times A4$$

$$A5 = \left[\frac{Y(N+K+1) - Y(N+K)}{ZZ(K+1) - ZZ(K)} - \frac{Y(N+K) - Y(N+K-1)}{ZZ(K) - ZZ(K-1)}\right] \frac{2}{ZZ(K+1) - ZZ(K-1)}$$

$$A1 = (1 - CHI) \times A1 + CHI \times A5 \quad .$$

It is these CHI-weighted expressions for A1 and A2 that are actually used in the acceleration equation.

The second departure is that, to partially compensate for the simplifying assumption of isentropic flow, NRL has introduced an artificial viscosity term at all interior points to help maintain a smooth solution, i.e., on the right-hand side of the acceleration equation there is added the term

$$\mathrm{ANUC} \times \left\{ |\mathrm{DVDZP}| \times \mathrm{DVDZP} - |\mathrm{DVDZM}| \times \mathrm{DVDZM} \right\} ,$$

where

$$\mathrm{ANUC} = \mathrm{ANU} \times [\mathrm{ZZ}(K+1) - \mathrm{ZZ}(K-1)] \times [\mathrm{RRO}(K)]^{\mathrm{GAMMA}}$$

$$\mathrm{ANU} = 0.1$$

$$\mathrm{DVDZP} = \frac{\mathrm{DERY}(N+K+1) - \mathrm{DERY}(N+K)}{\mathrm{ZZ}(K+1) - \mathrm{ZZ}(K)}$$

and DVDZM equals the value of DVDZP from the previous pass through the DO-loop over the points in the column.

In addition to the above-mentioned departures, SAI has made two changes in the NRL Subroutine FUNCT. First, we have modified the NRL procedure at the (stationary) bottom Lagrangian point by requiring the density to remain constant instead of letting it be determined by the amount of motion undergone by the second-lowest point. The treatment of the bottom-point density obviously affects the HAG-interpolated values for the density between the two lowest Lagrangian points but (surprisingly) it does not affect the motion of any of the moving Lagrangian points until the column has been either restarted (with a new initialization) or rezoned (also with a new initialization). With a new initialization there is a new pressure profile, partially determined by the boundary condition prescribed for the density at the lowest point. It is this new pressure profile that affects the motion of the points above the lowest.

Our second change in Subroutine FUNCT is that we have provided a test to determine whether or not RRO(K), the ratio of the current density to the initial density at Lagrangian-point K, is negative as a result of two adjacent points crossing owing to too large a time step. (If RRO(K) is negative, the program used to abort without having a chance

to try a smaller time step.) To prevent an abortion when RRO(K) is negative, we require the program to return to near the beginning of Subroutine RKAM2G to try again with one-tenth the previous time step. Two such emergency returns are permitted before allowing the column to undergo an emergency rezone, initiated by artificially setting the bisection counter IHLF to 11 and causing a return to Subroutine HYDROG.

4.7 REZONE IN NRLHYD (SUBROUTINE REZONE)

4.7.1 Purpose

To provide for maintaining a reasonable resolution of the Lagrangian points in the (more important) lower portion of the HAG module as a column expands to very high altitude, NRL developed a rezone procedure which we modified and incorporated into Subroutine REZONE.

4.7.2 General Features of Subroutine REZONE

Subroutine REZONE resets the positions and properties of the Lagrangian points for each column whose geocentric radius of the uppermost point exceeds a given geocentric radius HGTMAX at the hydro-advance time TSTOP. The number of Lagrangian points in a rezoned column is kept the same ($NCELZ_{NRL} = NCELZ_{SAI} + 1$). The new Lagrangian-point separation distances (DELHA2(K)) are read by DRIVER in Namelist SETUP1 and passed through REZONN Common. If DELHA2(1) = 0., the rezoned separation distances are evenly spaced as proposed by NRL. Table 4 gives the currently used values for the initial and rezoned Lagrangian-point separation distances and altitudes.

Subroutine REZONE uses linear interpolation for velocity, electron temperature, and N_2 vibration temperature and uses logarithmic

Table 4. Nominal Values for the Initial and Rezoned Lagrangian-Point Separation Distances and Altitudes in NRLHYD.

Point Index, K	Before Rezone			After Rezone		
	Point Separation, km[a]	Point Altitude, km	Cell-Top Altitude, km	Point Separation, km	Point Altitude, km	Cell-Top Altitude, km
			88.25[b]			88.25[a]
1	3.5	90.0	91.75	5.0	90.0	92.5
2	6.5	93.5	96.75	12.5	95.0	101.25
3	6.25	100.0	103.125	17.5	107.5	116.25
4	7.0	106.25	109.75	22.5	125.0	136.25
5	7.75	113.25	117.125	27.5	147.5	161.25
6	8.5	121.25	125.25	32.5	175.0	191.25
7	11.0	129.5	135.0	37.5	207.5	226.25
8	14.5	140.0	147.75	45.0	245.0	267.5
9	21.0	155.0	165.5	55.0	290.0	317.5
10	31.0	176.0	191.5	65.0	345.0	377.5
11	44.0	207.0	229.0	75.0	410.0	447.5
12	61.0	251.0	281.5	85.0	485.0	527.5
13	85.0	312.0	354.5	95.0	570.0	617.5
14		397.0	439.5		665.0	712.5

[a] The code uses centimeters instead of kilometers.

[b] Bottom of grid for energy deposition purposes.

interpolation for pressure and density-dependent variables. These interpolations are made by calling Subroutine INTERP.

Subroutine REZONE is called from DRIVER after all the columns have been advanced first for hydrodynamics and then for chemistry. In looping over the columns, Subroutine REZONE rezones only those columns for which a rezone flag (IREZ(NN)) has been set (based on the rezone criterion) in Subroutine HYDROG immediately after Subroutine RKAM2G completes the hydrodynamics for Column NN.

If the rezone flag has been set for Column NN, then Subroutine ECRD is called to obtain the column quantities from Time-Slot 2. For development purposes, we print the status of the Lagrangian-point quantities, and also the molecular-ion density and heavy-particle temperature, before rezone. After the new Lagrangian-point quantities are determined, Entry-Point ECWR in Subroutine ECRD is called to store the Lagrangian-point quantities in Time-Slot 2. Again, for development purposes, we print the rezoned Lagrangian-point properties, including the molecular-ion density and heavy-particle temperature.

4.7.3 Resetting Vertical-Direction Indices of Time-Dependent Event Points

After the basic portion of the rezoning has been completed, the index (KX(L)) for the Lagrangian points, if any, associated with the event-point L is computed, as well as the fractional vertical-position parameter (FRC(L)). These quantities, KX(L) and FRC(L), are passed through EVENTX Common. If the point of interest is above the rezoned column, a message to that effect is printed.

4.7.4 Hydro Cycle Counters

At the end of Subroutine REZONE, provided at least one column has been rezoned, the status of the hydro cycle counters (KCYC(NN)) is printed and then the counters are zeroed.

4.8 INTERPOLATION ROUTINE IN NRLHYD (SUBROUTINE INTERP)

Subroutine INTERP(K, DUMX, DUMY, M, X, Y, MODE) is called from Subroutine REZONE to provide interpolated values of the Lagrangian-point quantities. The definitions of the arguments are as follows:

K = Index for which the abscissa value (X), at which one wishes to determine the ordinate value (Y), satisfies the relation $X(K) < X < X(K+1)$.

DUMX = Array of abscissas (old Lagrangian-point altitudes).

DUMY = Array of ordinates (variable dependent on old Lagrangian-point altitudes).

M = Dimension of DUMX and DUMY.

X = X-coordinate at which interpolated value for Y is desired (new Lagrangian-point altitudes).

Y = Returned interpolated value.

MODE = 1, linear two-point interpolation.
2, logarithmic two-point interpolation.

4.9 VERTICAL MOTION OF A POINT (SUBROUTINE TIMVAR)

See Section 3.6 in SAIHYD for a general discussion of the properties of Subroutine TIMVAR, since the NRLHYD version is very similar to the SAIHYD version, except for two related features. Instead of vertically locating the Point X as having a fractional-distance location

within a cell as in SAIHYD, we use the fractional-distance between the two closest Lagrangian points. We also specify the index of the closest Lagrangian-point K, with an assigned plus or minus sign to denote whether the Point X is above or below Lagrangian-point K, respectively.

5. CONTROL ROUTINE FOR ADVANCING THE CHEMISTRY (SUBROUTINE CHEMG)

Subroutine CHEMG, the routine controlling the subroutines doing the actual advancement of the chemistry, performs the following functions.

a. Controls the looping over all the columns in the grid while the chemistry is being done.

b. Effects the transfer of the NCOL cell quantities for the column of interest from large core memory to small core memory, similar to the transfer effected from HYDROG in preparation for doing the hydrodynamics. In addition to transferring the just-described data from Time-Slot 1, data are also transferred from Time-Slot 2 since some of these data are required for the GET-chemistry module.

c. Prints, for development purposes, the status of the Lagrangian-cell quantities, and also the molecular-ion density and heavy-particle temperature, before doing the chemistry.

d. Initializes the variables in SPECEF Common before calling Subroutine CHEMEF. These variables for Cell K (K = 1, NCELZ) are:

RHO(1)	=	BUF1(LOC+ 2)	Density at Time T1
TEL(1)	=	BUF1(LOC+ 3)	Electron temperature at Time T1
ENE(1)	=	BUF1(LOC+ 4)	Electron density at Time T1
EN4S(1)	=	BUF1(LOC+ 7)	$N(^4S)$ density at Time T1
EN2D(1)	=	BUF1(LOC+ 8)	$N(^2D)$ density at Time T1
OATOM(1)	=	BUF1(LOC+ 9)	O density at Time T1
EN2(1)	=	BUF1(LOC+10)	N_2 density at Time T1
O2(1)	=	BUF1(LOC+11)	O_2 density at Time T1
ENO(1)	=	BUF1(LOC+12)	NO density at Time T1
ENP(1)	=	BUF1(LOC+13)	N^+ density at Time T1
OP(1)	=	BUF1(LOC+14)	O^+ density at Time T1
PRES(1)	=	BUF1(LOC+15)	Pressure at Time T1
TVIBN2(1)	=	BUF1(LOC+17)	N_2 vibration temperature at Time T1
CO2(1)	=	BUF1(LOC+18)	CO_2 density at Time T1

QAMB(1)	= BUF1(LOC+20)	Ambient ion production rate at Time T1
HE(1)	= BUF1(LOC+22)	He density at Time T1
RHO(2)	= BUF2(LOC+ 2)	Density at Time T2
PRES(2)	= BUF2(LOC+15)	Pressure at Time T2

We note: (1) He is not used in the GET-chemistry but is used in the NRL-chemistry module, (2) the electron temperature and N_2 vibrational temperature are the same quantity in the GET-chemistry but are different in the NRL-chemistry module, and (3) pressure at Time T2 is used in the GET-chemistry but is not used in the NRL-chemistry module.

e. Calls Subroutine CHEMEF to advance the chemistry in a column from the start time T1 to the stop time T2.

f. Computes, for the benefit of Subroutine ENECHK in SAIHYD if the energy-check flag (IENCHK) equals one, the total energy returned to the cell by the chemistry.

g. Updates the BUF2 array (compare Step d above).

h. Outputs the following chemistry quantities for Column NN at Time T2: Electron temperature; N_2 vibrational temperature; densities of electrons, $N(^4S)$, $N(^2D)$, O, N_2, O_2, NO, N^+, and O^+; pressure; heavy-particle temperatures at Times T1 and T2.

i. Effects the transfer of the NCOL cell quantities for the column of interest from small core memory to large core memory by a call to Entry Point ECWR in Subroutine ECRD.

6. TEST PROBLEM AND RUNNING TIMES

To compare the two hydrodynamics modules, SAIHYD and NRLHYD, we present results for a three-minute problem in which there is a large-energy event at 200-km altitude at $t = 0$ sec. The grid was limited to a row of six columns, spaced 100-km apart at 100-km altitude. The atmosphere used corresponds to the CIRA-1965 atmosphere for which the solar flux, SBAR, equals 157.57 (see Vol. 14a). The event point was placed at the center of Column 6 (achieved by resetting the event point after the grid was established). The problem was run with both SAIHYD and NRLHYD, but with only one chemistry module, GETCHM.

Breakdowns of the running time and the hydrodynamic cycles for this problem are given in Tables 5 and 6, respectively. SAIHYD was about $3\frac{1}{3}$ times faster than NRLHYD for this problem. For the two-event sample problem presented in Vol. 13, SAIHYD was about four times faster than NRLHYD.

Figures 13 and 14 show the altitude-vs-time profiles of every other Lagrangian cell-center (or point) for Columns 6 and 3, respectively, for both SAIHYD and NRLHYD. The motions predicted by the two forms of the hydrodynamics seem to agree quite well, on the whole.

Figure 15 shows the electron density profile in Column 6 at $t = 60$ sec for both SAIHYD and NRLHYD, and Fig. 16 shows the same information for Column 3 at $t = 120$ sec. The constancy of the electron density over a given altitude interval corresponds to the assumed uniformity of the cell properties throughout a cell.

Table 5. Breakdown of SAI-HAG-Module Running Time on CDC-7600 for One-Event Test Problem for SAIHYD and NRLHYD.[a]

	SAIHYD, Δt (sec)				NRLHYD, Δt (sec)			
Comment	Hydro	GETCHM	Rezone	Other	Hydro	GETCHM	Rezone	Other
Compile & load				8.065				8.093
Initialize routines & grid				0.075				0.065
PROMPG				1.613				1.936
	(DEBRIS = 1.447)[b]				(DEBRIS = 1.759)[b]			
0-1 sec	0.051	0.215			0.118	0.227		
1-3	0.050	0.128			0.150	0.139		
3-10	0.103	0.128			0.263	0.139		
10-30	0.163	0.128			0.502	0.141		
30-60	0.072	0.131			0.465	0.141		
		Cols. 5 & 6: 0.037				Cols. 5 & 6: 0.014		
60-90	0.061	0.131			0.352	0.140		
		Cols. 4, 5, & 6: 0.055				Col. 4: 0.007		
90-120	0.058	0.131			0.318	0.140		
		Col. 3: 0.018				Cols. 5 & 6: 0.014		
120-150	0.057	0.131			0.280	0.141		
		Cols. 4, 5, & 6: 0.056				Cols. 3 & 4: 0.013		
150-180	0.056	0.130			0.277	0.140		
Totals	0.671	1.253	0.166	9.753	2.725	1.348	0.048	10.094
Total	$\Sigma \Delta t$ = 11.843 cf'd w/ 11.859 on clock				$\Sigma \Delta t$ = 14.215 cf'd w/ 14.224 on clock			
Cycles	243				869			
Time per cycle	2.76E-3				3.14E-3			

[a]Grid contains 13 SAIHYD cells and 14 NRLHYD points in each of six columns. Large-energy event occurs at t = 0 at 200-km altitude. Total problem time is three minutes.

[b]Recent revision reduces this time by more than a factor of two.

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Table 6. Cycles for the Two Versions of the Hydrodynamics Module Used in the One-Event Test Problem.

	SAIHYD											
	Δ Cycles for Column						Cumulative Cycles for Column					
Δt, sec	1	2	3	4	5	6	1	2	3	4	5	6
0-1	2	2	2	2	2	2	2	2	2	2	2	2
1-3	1	1	1	1	1	3	3	3	3	3	3	5
3-10	2	2	2	3	6	8	5	5	5	6	9	13
10-30	4	4	4	7	13	19	9	9	9	13	22	32
30-60	3	4	7	10	9	18	12	13	16	23	31	50
60-90	3	5	7	6	5	5	15	18	23	29	36	55
90-120	3	4	5	4	4	4	18	22	28	33	40	59
120-150	3	4	3	3	4	5	21	26	31	36	44	64
150-180	3	4	3	3	4	4	24	30	34	39	48	68
	NRLHYD											
0-1	2	2	2	2	2	4	2	2	2	2	2	4
1-3	4	4	4	4	4	8	6	6	6	6	6	8
3-10	8	8	9	14	14	26	14	14	15	20	20	34
10-30	11	14	22	40	39	63	25	28	37	60	59	97
30-60	14	19	19	34	32	54	39	47	56	94	91	151
60-90	14	19	21	28	19	19	53	66	77	122	110	170
90-120	14	15	18	19	17	19	67	81	95	141	127	189
120-150	14	14	14	15	14	14	81	95	109	156	141	203
150-180	14	14	14	14	14	14	95	109	123	170	155	217

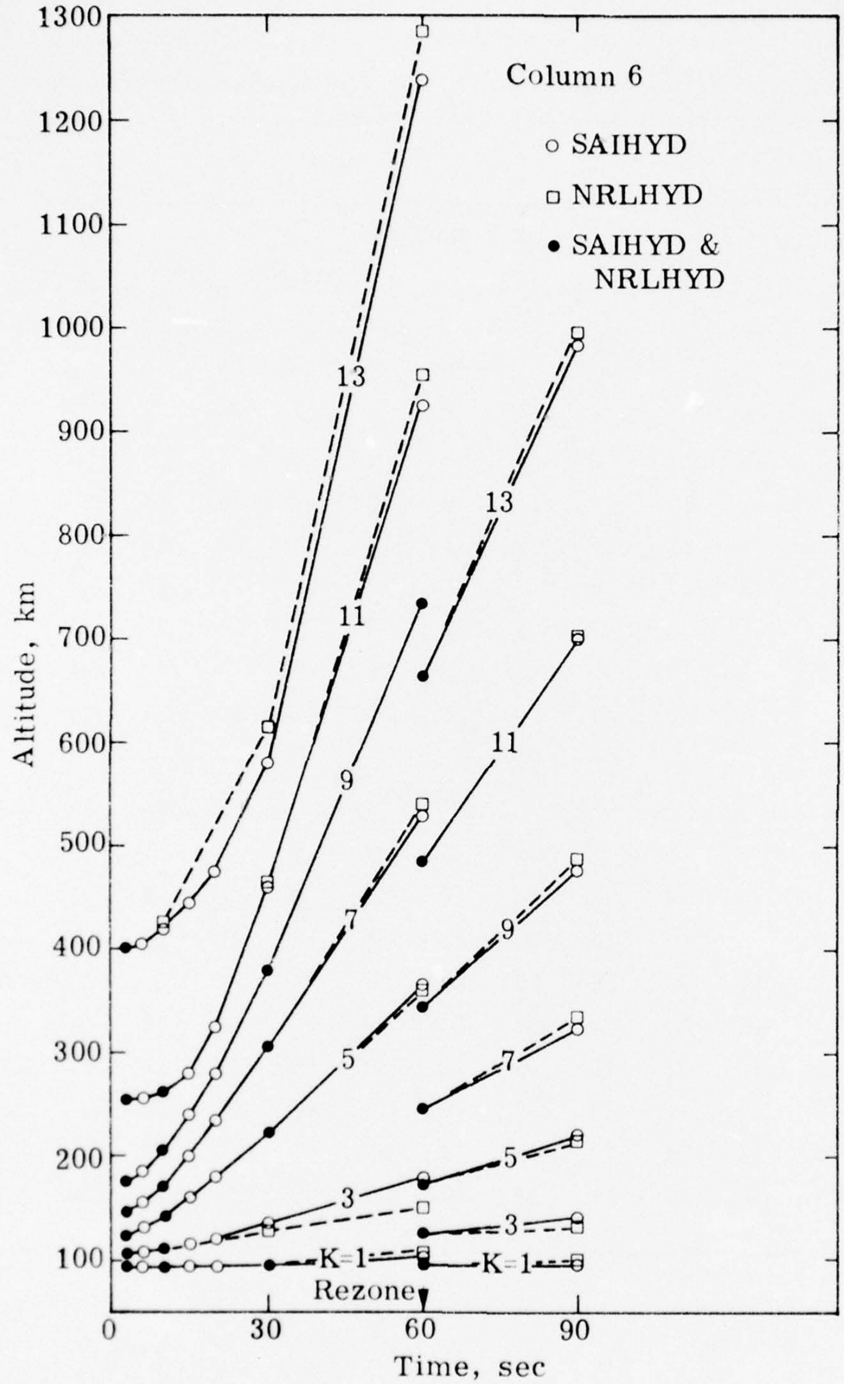

Fig. 13. Altitude-versus-Time Profiles of Lagrangian Positions in Column 6 of Test Problem for SAIHYD and NRLHYD. K labels the vertical cell number in SAIHYD; only odd values are shown.

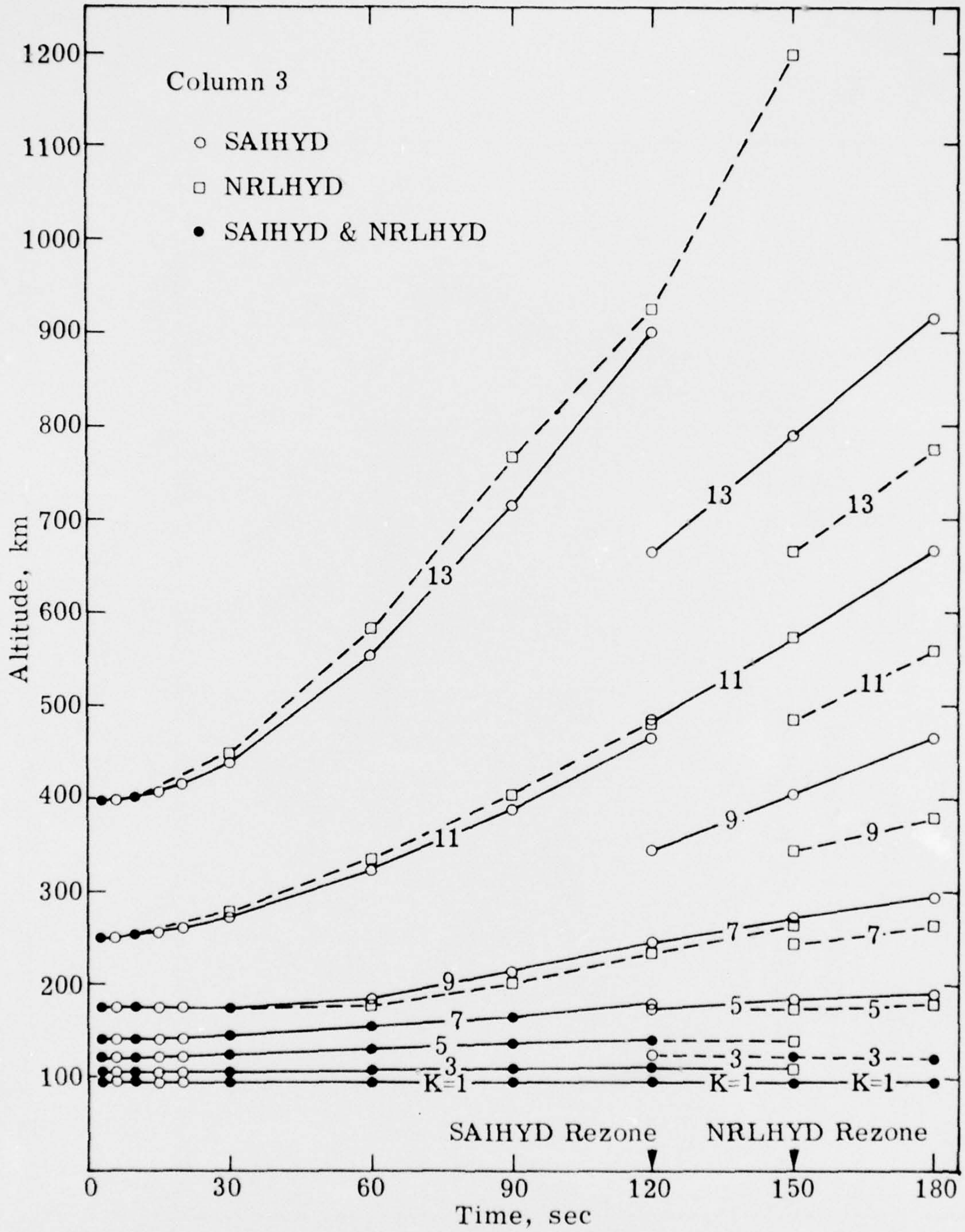

Fig. 14. Altitude-versus-Time Profiles of Lagrangian Positions in Column 3 of Test Problem for SAIHYD and NRLHYD. K labels the vertical cell number in SAIHYD; only odd values are shown.

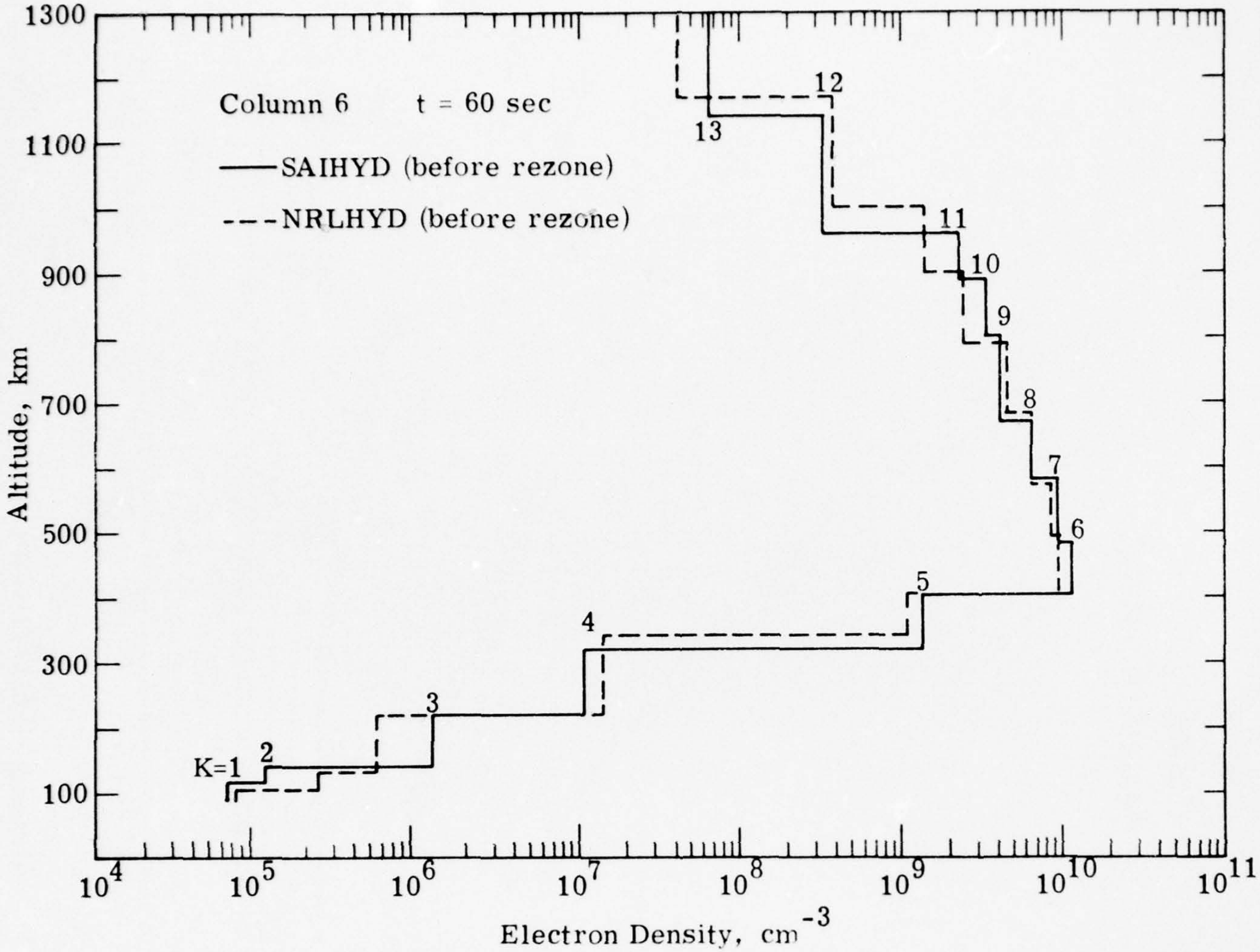

Fig. 15. Electron Density Profiles in Column 6 at t = 60 sec of Test Problem for SAIHYD and NRLHYD. K labels the vertical cell number in SAIHYD.

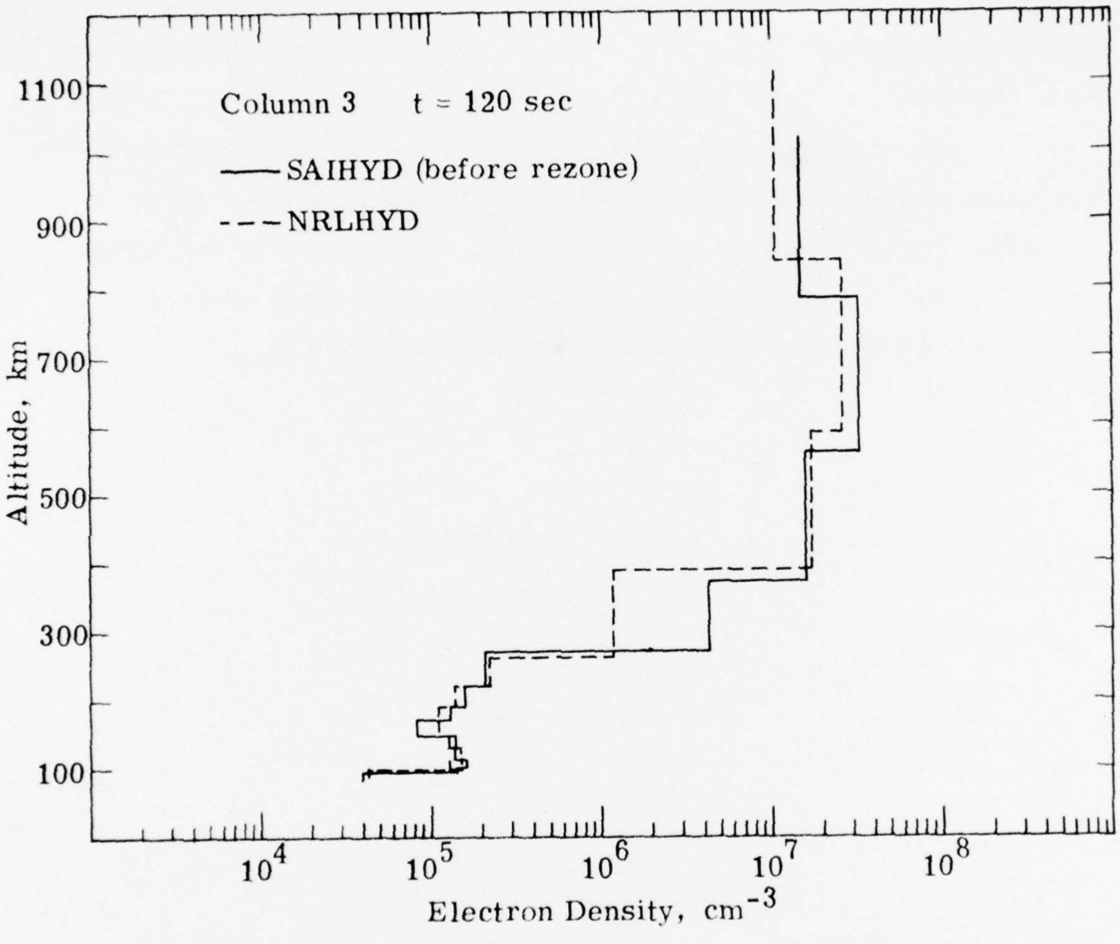

Fig. 16. Electron Density Profiles in Column 3 at t = 120 sec of Test Problem for SAIHYD and NRLHYD.

For the reader who desires more detailed results for the hydrodynamics (and chemistry), we are providing the computer printouts for both the SAIHYD and NRLHYD runs. Before doing so, we provide the following general guide. At $t = 0.0^-$, before the energy deposition from the event, we print the cell quantities for ambient (gridded) atmospheric conditions. A guide to this print, as to the input to the hydro and chemistry at $t = 0.0^+$ and to the output from rezone, is given in Table 7. The entries in the blocks of hydro and chemistry quantities are defined in Tables 8 and 9. The computer printout is given in Tables 10 and 11 for SAIHYD and NRLHYD, respectively.

Table 7. Guide to Printout for Cell Quantities.

No.	Heading	Quantity
1	HC	Cell-center altitude, cm [SAIHYD]
	HC	Altitude of point, cm [NRLHYD]
2	RHO	Mass density, g/cm^3
3	T ELECT	Electron temperature,[a] °K
4	ENE	Electron density, cm^{-3}
5	VCENTR	Cell-center velocity, cm/sec [SAIHYD]
	VPOINT	Velocity of point, cm/sec [NRLHYD]
6	VEL	Cell-top-boundary velocity, cm/sec [SAIHYD]
	--	Not used [NRLHYD]
7	EN4S	Density $N(^4S)$, cm^{-3}
8	EN2D	Density $N(^2D)$, cm^{-3}
9	O	Density O, cm^{-3}
10	N2	Density N_2, cm^{-3}
11	O2	Density O_2, cm^{-3}
12	ENO	Density NO, cm^{-3}
13	ENP	Density N^+, cm^{-3}
14	OP	Density O^+, cm^{-3}
15	P	Total pressure, $dyne/cm^2$
16	Q	Artificial viscous pressure, $dyne/cm^2$ [SAIHYD]
	--	Not used [NRLHYD]
17	T N2VIB	≡ T ELECT
18	CO2	Density CO_2, cm^{-3}
19	--	Not used
20	QAMB	Effective ambient ion-pair production rate, $(\text{ion-pair})/cm^{-3}$
21	(HTOP)0	Altitude of cell-top-boundary in ambient atmosphere, cm [SAIHYD]
	--	Not used [NRLHYD]
22	HE	Density of He, cm^{-3}
23	M^+	Density of molecular ions $(e-N^+-O^+)$, cm^{-3}
24	TH	Heavy-particle kinetic temperature, °K

[a]Actually, temperature common to electrons, $O(^1D)$-to-$O(^3P)$ population ratio, and N_2 vibration.

Table 8. Guide to Printout for Hydrodynamic Output Quantities.

Column No.	Heading	Quantity
1	K	Cell index
2	CEN. ALT.	Cell-center altitude, cm [SAIHYD]
	ALTITUDE	Altitude of point, cm [NRLHYD]
3	DENSITY	Density, g/cm^3
4	VCENTR	Cell-center vertical velocity,[a] cm/sec [SAIHYD]
	VEL	Velocity of point, cm/sec [NRLHYD]
5	VOLUME	Steradianal volume of cell, cm^3/sr [SAIHYD]
	DEN. RATIO	Ratio of current- to initial-density [NRLHYD]
6	INT. E.	Internal energy, erg/g
7	PRESS.	Pressure, dyne/cm
8	Q	Artificial viscous pressure, dyne/cm^2 [SAIHYD]
	--	Not used [NRLHYD]
9	TOP ALT.	Cell-top-boundary altitude, cm [SAIHYD]
	--	Not used [NRLHYD]
10	VTOP	Cell-top-boundary velocity, cm/sec [SAIHYD]
	--	Not used [NRLHYD]

[a]Mean of two adjacent boundary velocities. Positive sign is upward motion.

Table 9. Guide to Printout for Chemistry Output Quantities[a, d] (from CHEMEF[e]).

Column No.	Heading	Quantity
1	K	Cell index
2	TEL	Electron temperature,[b] °K
3	TVIBN2	≡ TEL
4	ENE	Electron density, cm^{-3}
5	N(4S)	Density $N(^4S)$, cm^{-3}
6	N(2D)	Density $N(^2D)$, cm^{-3}
7	O	Density O, cm^{-3}
8	N2	Density N_2, cm^{-3}
9	O2	Density O_2, cm^{-3}
10	NO	Density NO, cm^{-3}
11	NP	Density N^+, cm^{-3}
12	OP	Density O^+, cm^{-3}
13	PRES	Pressure, $dyne/cm^2$
14	TEM(1)	Heavy-particle temperature at TDAT1,[c] °K
15	TEM(2)	Heavy-particle temperature at TDAT2,[c] °K

[a]All quantities are at time TDAT2 except TEM(1) which is at TDAT1.

[b]Temperature common to electrons, $O(^1D)$-to-$O(^3P)$ population ratio, and N_2 vibration.

[c]Temperature inferred by subtracting electron pressure from total pressure.

[d]The molecular ion density, regarded at $[NO^+]$, may be computed from charge conservation: $[NO^+]$ = ENE - NP - OP.

[e]Chemistry developed by GET personnel.

Table 10. SAIHYD Results for Test Problem.

CELL QUANTITIES BUF(1) THROUGH BUF(22) AT AMBIENT ATMOSPHERIC CONDITIONS AND M+,TH

	HC O2 (HTOP)10	RHO END HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 QAMB
K = 1	9,350E+06	1,732E-09	2.163E+02	2,948E+04	0,	0,	5,882E+05	1,000E+00	3,378E+11	2,844E+13
	7,524E+12	6,287E+07	1,000E+00	9,624E-03	1,085E+00	0,	2,163E+02	1,167E+10	IIII	4,614E+02
	9,700F+06	1,686E+09	2,948E+04	2,163E+02						
K = 2	1,000E+07	5,410E-10	2.226E+02	1,060E+05	0,	0,	1,032E+06	1,000E+00	4,478E+11	8,883E+12
	2.179E+12	6,575E+07	1.000E+00	1,792E+00	3,539E-01	0,	2,226E+02	3,644E+09	IIII	5,810E+03
	1,030E+07	5,267E+08	1,060E+05	2,226E+02						
K = 3	1,063E+07	1,916E-10	2,445E+02	1,197E+05	0,	0,	1,655E+06	1,000E+00	3,391E+11	3,146E+12
	6,816E+11	5,577E+07	1,000E+00	1,504E+01	1,407E-01	0,	2,445E+02	1,072E+09	IIII	6,696E+03
	1,095F+07	1,866E+08	1,197E+05	2,445E+02						
K = 4	1,132F+07	6,474E-11	2,972E+02	1,376E+05	0,	0,	2,590E+06	1,000E+00	1,582E+11	1,063E+12
	2,085E+11	4,179E+07	1,000E+00	8,339E+01	5,868E-02	0,	2,972E+02	2,665E+08	IIII	7,047E+03
	1,170E+07	6,304E+07	1,376E+05	2,972E+02						
K = 5	1,210E+07	2,273E-11	4,452E+02	1,546E+05	0,	0,	3,739E+06	1,000E+00	6,110E+10	3,731E+11
	7,062E+10	3,042E+07	1,000F+00	2,448E+02	2,714E-02	0,	4,452E+02	4,955E+07	IIII	6,024E+03
	1,250E+07	2,425E+07	1,544E+05	3,893E+02						
K = 6	1,295E+07	9,206E-12	6,828E+02	1,784E+05	0,	0,	5,166E+06	1,000E+00	3,200E+10	1,500E+11
	2,600F+10	2,560E+07	1,000E+00	7,870E+02	1,466E-02	0,	6,828E+02	1,400E+07	IIII	5,121E+03
	1,340E+07	1,860E+07	1,777E+05	5,105E+02						
K = 7	1,405E+07	3,972E-12	9,125E+02	2,133E+05	0,	0,	6,874F+06	1,000E+00	1,765E+10	6,374E+10
	1,013F+10	2,142E+07	1,000E+00	2,760E+03	8,335E-03	0,	9,125E+02	4,206E+06	IIII	5,430E+03
	1,470F+07	1,470E+07	2,105E+05	6,594E+02						
K = 8	1,550F+07	1,729E-12	1,150E+03	2,620E+05	0,	0,	8,250F+06	1,000E+00	9,823E+09	2,705E+10
	3,932F+09	1,674E+07	1,000E+00	9,647E+03	4,622E-03	0,	1,150E+03	1,244E+06	IIII	6,465E+03
	1,630F+07	1,170E+07	2,523E+05	8,196E+02						
K = 9	1,760F+07	7,182E-13	1,434E+03	3,495E+05	0,	0,	8,894E+06	1,000E+00	5,364E+09	1,075E+10
	1,407F+09	1,203E+07	1,000E+00	3,993E+04	2,462E-03	0,	1,434E+03	3,241E+05	IIII	8,373E+03
	1,890F+07	9,483E+06	3,096E+05	1,016E+03						
K =10	2,070F+07	2,668E-13	1,742E+03	4,848E+05	0,	0,	8,342E+06	1,000E+00	2,713E+09	3,690E+09
	4,244E+08	7,238E+06	1,000E+00	1,692E+05	1,155E-03	0,	1,742E+03	6,633E+04	IIII	9,875E+03
	2,250F+07	7,549E+06	3,157E+05	1,221E+03						
K =11	2,510F+07	9,152E-14	2,074E+03	6,627E+05	0,	0,	4,174E+06	1,000E+00	1,295F+09	1,098E+09
	1,079E+08	3,551E+06	1,000E+00	4,818E+05	4,982E-04	0,	2,074E+03	1,051E+04	IIII	6,571E+03
	2,770E+07	6,060E+06	1,809E+05	1,434E+03						
K =12	3,120E+07	2,814E-14	2,453E+03	7,058E+05	0,	0,	9,925E+05	1,000E+00	5,548E+08	2,610E+08
	2,110F+07	1,315E+06	1,000E+00	6,574E+05	1,959E-04	0,	2,453E+03	1,141E+03	IIII	1,655E+03
	3,470E+07	4,804E+06	4,843E+04	1,678E+03						
K =13	3,970F+07	7,500E-15	3,144E+03	4,716E+05	0,	0,	1,655E+05	1,000E+00	1,985E+06	4,353E+07
	2,733F+06	3,341E+05	1,000E+00	4,642E+05	7,642E-05	0,	3,144E+03	6,892E+01	IIII	1,495E+02
	4,470E+07	3,732E+06	7,478E+03	2,213E+03						

Table 10 continues through page 147.

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (1, 1) = 1

	HC O2 (HTOP)O	RHO END HE	T ELECT ENP M+	ENE UP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 OAMB
K = 1	9,350E+06	1,732E-09	4,603E+02	2,838E+09	0.	0.	1,521E+09	1,147E+08	3,361E+11	2,844E+13
	7,524E+12	6,286E+07	4,599E+01	2,641E+07	1,096E+00	0.	4,603E+02	1,167E+10	IIII	4,614E+02
	9,700E+06	1,686E+09	2,812E+09	2,186E+02						
K = 2	1,000E+07	5,410E-10	5,578E+02	3,205E+09	0.	0.	1,702E+09	1,630E+08	4,458E+11	8,880E+12
	2,178E+12	6,574E+07	2,868E+02	1,296E+08	3,673E-01	0.	5,578E+02	3,643E+09	IIII	5,810E+03
	1,030E+07	5,266E+08	3,076E+09	2,309E+02						
K = 3	1,063E+07	1,916E-10	5,988E+02	1,725E+09	0.	0.	9,076E+08	1,140E+08	3,383E+11	3,145E+12
	6,811E+11	5,574E+07	6,849E+02	1,403E+08	1,489E-01	0.	5,988E+02	1,072E+09	IIII	6,696E+03
	1,095E+07	1,865E+08	1,584E+09	2,585E+02						
K = 4	1,132E+07	6,474E-11	6,292E+02	7,667E+08	0.	0.	4,021E+08	5,866E+07	1,595E+11	1,063E+12
	2,075E+11	4,177E+07	1,388E+03	8,483E+07	6,622E-02	0.	6,292E+02	2,664E+08	IIII	7,047E+03
	1,170E+07	6,301E+07	6,818E+08	3,348E+02						
K = 5	1,210E+07	2,273E-11	7,306E+02	5,718E+08	0.	0.	3,006E+08	4,565E+07	6,278E+10	3,727E+11
	6,950E+10	3,058E+07	4,234E+03	6,918E+07	3,457E-02	0.	7,306E+02	4,949E+07	IIII	6,024E+03
	1,250E+07	2,422E+07	5,026E+08	4,941E+02						
K = 6	1,295E+07	9,206E-12	7,843E+02	3,181E+08	0.	0.	1,761E+08	3,206E+07	3,306E+10	1,497E+11
	2,531E+10	2,556E+07	1,283E+06	4,870E+07	1,919E-02	0.	7,843E+02	1,398E+07	IIII	5,121E+03
	1,340E+07	1,857E+07	2,681E+08	6,650E+02						
K = 7	1,405E+07	3,072E-12	6,869E+02	7,428E+07	0.	0.	5,162E+07	1,054E+07	1,826E+10	6,368E+10
	9,795E+09	2,140E+07	1,916E+06	1,376E+07	1,026E-02	0.	6,869E+02	4,202E+06	IIII	5,430E+03
	1,470E+07	1,469E+07	5,860E+07	8,081E+02						
K = 8	1,550E+07	1,729E-12	7,681E+02	5,330E+07	0.	0.	3,572E+07	5,767E+06	1,008E+10	2,702E+10
	3,778E+09	1,672E+07	2,397E+06	1,195E+07	5,568E-03	0.	7,681E+02	1,243E+06	IIII	6,405E+03
	1,630E+07	1,168E+07	3,895E+07	9,828E+02						
K = 9	1,760E+07	7,182E-13	9,079E+02	4,213E+07	0.	0.	2,234E+07	6,184E+05	5,451E+09	1,073E+10
	1,346E+09	1,200E+07	7,250E+06	9,934E+06	2,895E-03	0.	9,079E+02	3,234E+05	IIII	8,373E+03
	1,890E+07	9,463E+06	2,495E+07	1,188E+03						
K =10	2,070E+07	2,668E-13	1,633E+03	8,614E+07	0.	0.	3,517E+07	1,000E+00	2,712E+09	3,642E+09
	3,992E+08	7,148E+06	3,354E+07	1,691E+07	1,600E-03	0.	1,633E+03	6,547E+04	IIII	9,875E+03
	2,250E+07	7,452E+06	3,569E+07	1,662E+03						
K =11	2,510E+07	9,152E-14	2,439E+03	6,124E+07	0.	0.	2,648E+07	1,000E+00	1,283E+09	1,063E+09
	9,930E+07	3,446E+06	3,068E+07	1,324E+07	6,253E-04	0.	2,439E+03	1,017E+04	IIII	6,571E+03
	2,770E+07	5,867E+06	1,731E+07	2,293E+03						
K =12	3,120E+07	2,814E-14	4,877E+03	5,238E+07	0.	0.	1,784E+07	1,000E+00	5,349E+08	2,343E+08
	1,795E+07	1,191E+06	2,539E+07	1,581E+07	5,148E-04	0.	4,877E+03	1,025E+03	IIII	1,655E+03
	3,470E+07	4,314E+06	1,118E+07	4,025E+03						
K =13	3,970E+07	7,500E-15	6,921E+03	2,049E+07	0.	0.	4,641E+06	1,000E+00	1,869E+08	3,605E+07
	2,148E+06	2,813E+05	7,186E+06	9,942E+06	2,181E-04	0.	6,921E+03	5,708E+01	IIII	1,495E+02
	4,470E+07	3,091E+06	3,357E+06	5,671E+03						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (2, 1) = 2

	HC O2 (HTOP)O	RHO ENO HF	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 GAMB
K = 1	9,350E+06	1,732E-09	5,130E+02	6,037E+09	0,	0,	3,235E+09	2,439E+08	3,342E+11	2,843E+13
	7,523E+12	6,286E+07	9,783E+01	5,618E+07	1,109E+00	0,	5,130E+02	1,167E+10	IIII	4,614E+02
	9,700E+06	1,686E+09	5,981E+09	2,212E+02						
K = 2	1,000E+07	5,410E-10	6,369E+02	6,838E+09	0,	0,	3,594E+09	3,444E+08	4,436E+11	8,878E+12
	2,178E+12	6,572E+07	6,059E+02	3,411E+08	3,823E-01	0,	6,369E+02	3,642E+09	IIII	5,810E+03
	1,030E+07	5,264E+08	6,497E+09	2,401E+02						
K = 3	1,063E+07	1,916E-10	6,259E+02	2,204E+09	0,	0,	1,159E+09	1,456E+08	3,393E+11	3,145E+12
	6,804E+11	5,574E+07	8,753E+02	1,793E+08	1,540E-01	0,	6,259E+02	1,072E+09	IIII	6,696E+03
	1,095E+07	1,865E+08	2,024E+09	2,673E+02						
K = 4	1,132E+07	6,474E-11	7,275E+02	1,597E+09	0,	0,	8,346E+08	1,222E+08	1,619E+11	1,062E+12
	2,059E+11	4,175E+07	2,891E+03	1,767E+08	7,687E-02	0,	7,275E+02	2,662E+08	IIII	7,047E+03
	1,170E+07	6,297E+07	1,420E+09	3,878E+02						
K = 5	1,210E+07	2,273E-11	8,657E+02	1,196E+09	0,	0,	6,358E+08	1,013E+08	6,446E+10	3,722E+11
	6,835E+10	3,034E+07	1,025E+06	1,447E+08	4,249E-02	0,	8,657E+02	4,943E+07	IIII	6,024E+03
	1,250E+07	2,419E+07	[illegible]	6,049E+02						
K = 6	1,295E+07	9,206E-12	8,277E+02	4,039E+08	0,	0,	2,391E+08	4,890E+07	3,403E+10	1,496E+11
	2,478E+10	2,556E+07	4,945E+06	6,125E+07	2,210E-02	0,	8,277E+02	1,397E+07	IIII	5,121E+03
	1,340E+07	1,856E+07	3,377E+08	7,638E+02						
K = 7	1,405E+07	3,972E-12	8,077E+02	1,568E+08	0,	0,	9,449E+07	1,845E+07	1,864E+10	6,362E+10
	9,566E+09	2,139E+07	6,275E+06	2,855E+07	1,169E-02	0,	8,077E+02	4,198E+06	IIII	5,430E+03
	1,470E+07	1,468E+07	1,220E+08	9,179E+02						
K = 8	1,550E+07	1,729E-12	9,520E+02	1,271E+08	0,	0,	5,841E+07	4,732E+06	1,022E+10	2,698E+10
	3,681E+09	1,669E+07	1,766E+07	2,497E+07	6,278E-03	0,	9,520E+02	[illegible]	IIII	6,465E+03
	1,630E+07	1,166E+07	8,446E+07	1,104E+03						
K = 9	1,760E+07	7,182E-13	1,157E+03	9,747E+07	0,	0,	4,286E+07	1,177E+05	5,479E+09	1,070E+10
	1,308E+09	1,197E+07	1,470E+07	2,161E+07	3,267E-03	0,	1,157E+03	3,224E+05	IIII	8,373E+03
	1,890E+07	9,435E+06	6,116E+07	1,335E+03						
K =10	2,070E+07	2,668E-13	2,747E+03	2,590E+08	0,	0,	8,842E+07	1,000E+00	2,671E+09	3,541E+09
	3,765E+08	6,968E+06	1,198E+08	4,028E+07	2,499E-03	0,	2,747E+03	6,365E+04	IIII	9,875E+03
	2,250E+07	7,244E+06	9,892E+07	2,502E+03						
K =11	2,510E+07	9,152E-14	4,422E+03	1,791E+08	0,	0,	6,964E+07	1,000E+00	1,252E+09	9,925E+08
	8,978E+07	3,239E+06	9,856E+07	3,400E+07	1,565E-03	0,	4,422E+03	9,502E+03	IIII	6,571E+03
	2,770E+07	5,480E+06	4,659E+07	4,069E+03						
K =12	3,120E+07	2,814E-14	7,470E+03	1,200E+08	0,	0,	3,448E+07	1,000E+00	5,060E+08	2,025E+08
	1,502E+07	1,040E+06	5,804E+07	3,615E+07	1,008E-03	0,	7,470E+03	8,854E+02	IIII	1,655E+03
	3,470E+07	3,727E+06	2,579E+07	7,252E+03						
K =13	3,970E+07	7,500E-15	8,751E+03	3,526E+07	0,	0,	7,185E+06	1,000E+00	1,779E+08	3,103E+07
	1,803E+06	2,463E+05	1,231E+07	1,720E+07	3,463E-04	0,	8,751E+03	4,914E+01	IIII	1,495E+02
	4,470E+07	2,661E+06	5,749E+06	8,590E+03						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0.00

COLUMN (3, 1) = 3

	HC O2 (HTOP)O	RHO END HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 GAMH
K = 1	9.350E+06	1.732E-09	5.964E+02	1.524E+10	0.	0.	8.163E+09	6.155E+08	3.288E+11	2.843E+13
	7.521E+12	6.284E+07	2.469E+02	1.421E+08	1.148E+00	0.	5.964E+02	1.166E+10	IIII	4.614E+02
	9.300E+06	1.666E+09	1.509E+10	2.287E+02						
K = 2	1.000E+07	5.410E-10	7.196E+02	1.267E+10	0.	0.	6.733E+09	6.454E+08	4.404E+11	8.873E+12
	2.176E+12	6.568E+07	1.135E+03	4.928E+08	4.084E-01	0.	7.196E+02	3.640E+09	IIII	5.810E+03
	1.030E+07	5.261E+08	1.217E+10	2.561E+02						
K = 3	1.063E+07	1.916E-10	7.278E+02	4.735E+09	0.	0.	2.490E+09	3.130E+08	3.436E+11	3.143E+12
	6.774E+11	5.570E+07	1.681E+03	3.853E+08	1.790E-01	0.	7.278E+02	1.071E+09	IIII	6.696E+03
	1.095E+07	1.863E+08	4.350E+09	3.100E+02						
K = 4	1.132E+07	6.474E-11	8.943E+02	3.874E+09	0.	0.	2.021E+09	2.964E+08	1.686E+11	1.060E+12
	2.014E+11	4.168E+07	7.016E+03	4.287E+08	1.069E-01	0.	8.943E+02	2.658E+08	IIII	7.047E+03
	1.170E+07	6.287E+07	3.445E+09	5.365E+02						
K = 5	1.210E+07	2.273E-11	9.990E+02	2.061E+09	0.	0.	1.142E+09	1.991E+08	6.869E+10	3.715E+11
	6.580E+10	3.029E+07	1.054E+07	2.485E+08	5.846E-02	0.	9.990E+02	4.934E+07	IIII	6.024E+03
	1.250E+07	2.415E+07	1.802E+09	8.271E+02						
K = 6	1.295E+07	9.206E-12	8.770E+02	5.188E+08	0.	0.	3.187E+08	6.766E+07	3.611E+10	1.495E+11
	2.369E+10	2.555E+07	1.490E+07	7.715E+07	2.803E-02	0.	8.770E+02	1.396E+07	IIII	5.121E+03
	1.340E+07	1.855E+07	4.266E+08	9.632E+02						
K = 7	1.405E+07	3.972E-12	1.051E+03	4.262E+08	0.	0.	1.945E+08	2.095E+07	1.937E+10	6.345E+10
	9.086E+09	2.134E+07	5.248E+07	6.904E+07	1.501E-02	0.	1.051E+03	4.187E+06	IIII	5.430E+03
	1.470E+07	1.464E+07	3.047E+08	1.169E+03						
K = 8	1.550E+07	1.729E-12	1.455E+03	4.751E+08	0.	0.	1.000E+08	1.000E+00	1.051E+10	2.680E+10
	3.466E+09	1.659E+07	2.273E+08	6.884E+07	8.472E-03	0.	1.455E+03	1.233E+06	IIII	6.465E+03
	1.630E+07	1.159E+07	1.790E+08	1.466E+03						
K = 9	1.760E+07	7.182E-13	1.947E+03	3.792E+08	0.	0.	1.182E+08	1.000E+00	5.484E+09	1.054E+10
	1.216E+09	1.180E+07	1.170E+08	6.470E+07	4.728E-03	0.	1.947E+03	3.177E+05	IIII	8.373E+03
	1.890E+07	9.296E+06	1.975E+08	1.887E+03						
K =10	2.070E+07	2.668E-13	5.598E+03	8.915E+08	0.	0.	3.181E+08	1.000E+00	2.561E+09	3.147E+09
	3.121E+08	6.267E+06	5.126E+08	1.140E+08	6.660E-03	0.	5.598E+03	5.657E+04	IIII	9.875E+03
	2.250E+07	6.438E+06	2.650E+08	5.972E+03						
K =11	2.510E+07	9.152E-14	8.648E+03	6.065E+08	0.	0.	1.851E+08	1.000E+00	1.115E+09	7.640E+08
	6.426E+07	2.549E+06	3.366E+08	1.191E+08	4.798E-03	0.	8.648E+03	7.314E+03	IIII	6.571E+03
	2.770E+07	4.218E+06	1.506E+08	1.076E+04						
K =12	3.120E+07	2.814E-14	1.069E+04	2.572E+08	0.	0.	6.055E+07	1.000E+00	4.456E+08	1.440E+08
	1.003E+07	7.628E+05	1.246E+08	8.225E+07	2.264E-03	0.	1.069E+04	6.297E+02	IIII	1.655E+03
	3.470E+07	2.651E+06	5.038E+07	1.482E+04						
K =13	3.470E+07	7.500E-15	1.100E+04	6.109E+07	0.	0.	1.075E+07	1.000E+00	1.622E+08	2.308E+07
	1.283E+06	1.905E+05	2.126E+07	3.063E+07	6.119E-04	0.	1.100E+04	3.655E+01	IIII	1.495E+02
	4.470E+07	1.979E+06	9.181E+06	1.443E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0.00

COLUMN (4, 1) = 4

K	HC O2 (HTUP)O	RHO ENO HF	T ELECT ENP H+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 QAMH
K = 1	9.350E+06	1.732E-09	7.485E+02	4.876E+10	0.	0.	2.610E+10	1.968E+09	3.092E+11	2.840E+13
	7.514E+12	6.278E+07	7.893E+02	4.985E+08	1.288E+00	0.	7.485E+02	1.165E+10	IIII	4.614E+02
	9.700E+06	1.684E+09	4.826E+10	2.558E+02						
K = 2	1.000E+07	5.410E-10	8.320E+02	2.419E+10	0.	0.	1.286E+10	1.233E+09	4.395E+11	8.604E+12
	2.171E+12	6.562E+07	2.168E+03	9.413E+08	4.719E-01	0.	8.320E+02	3.637E+09	IIII	5.810E+03
	1.030E+07	5.256E+08	2.325E+10	2.951E+02						
K = 3	1.063E+07	1.916E-10	9.530E+02	1.459E+10	0.	0.	7.668E+09	9.644E+08	3.675E+11	3.135E+12
	6.601E+11	5.557E+07	5.796E+03	1.187E+09	2.950E-01	0.	9.530E+02	1.069E+09	IIII	6.696E+03
	1.095E+07	1.859E+08	1.340E+10	5.069E+02						
K = 4	1.132E+07	6.474E-11	1.233E+03	1.161E+10	0.	0.	6.193E+09	9.617E+08	1.898E+11	1.054E+12
	1.869E+11	4.146E+07	1.754E+07	1.284E+09	2.094E-01	0.	1.233E+03	2.644E+08	IIII	7.047E+03
	1.170E+07	6.252E+07	1.031E+10	1.036E+03						
K = 5	1.210E+07	2.273E-11	1.065E+03	2.610E+09	0.	0.	1.611E+09	3.303E+08	8.136E+10	3.710E+11
	5.922E+10	3.027E+07	6.156E+07	3.102E+08	9.561E-02	0.	1.065E+03	4.926E+07	IIII	6.024E+03
	1.250E+07	2.411E+07	2.239E+09	1.336E+03						
K = 6	1.295E+07	9.206E-12	1.256E+03	1.765E+09	0.	0.	9.047E+08	1.370E+08	4.074E+10	1.467E+11
	2.082E+10	2.542E+07	1.408E+08	2.448E+08	4.812E-02	0.	1.256E+03	1.388E+07	IIII	5.121E+03
	1.340E+07	1.844E+07	1.379E+09	1.625E+03						
K = 7	1.405E+07	3.972E-12	1.795E+03	1.879E+09	0.	0.	6.937E+08	1.000E+00	2.081E+10	6.258E+10
	7.791E+09	2.106E+07	3.492E+08	2.513E+08	2.693E-02	0.	1.795E+03	4.129E+06	IIII	5.430E+03
	1.470E+07	1.444E+07	1.278E+09	2.044E+03						
K = 8	1.550E+07	1.729E-12	3.934E+03	3.608E+09	0.	0.	9.604E+08	1.000E+00	1.016E+10	2.496E+10
	2.746E+09	1.550E+07	1.573E+09	3.741E+08	2.604E-02	0.	3.934E+03	1.148E+06	IIII	6.465E+03
	1.630E+07	1.079E+07	1.661E+09	4.107E+03						
K = 9	1.760E+07	7.182E-13	6.616E+03	3.453E+09	0.	0.	9.585E+08	1.000E+00	4.888E+09	8.741E+09
	6.381E+08	9.933E+06	1.838E+09	3.753E+08	2.391E-02	0.	6.616E+03	2.634E+05	IIII	8.373E+03
	1.090E+07	7.708E+06	1.240E+09	7.958E+03						
K =10	2.070E+07	2.668E-13	1.245E+04	4.106E+09	0.	0.	1.001E+09	1.000E+00	1.787E+09	1.467E+09
	1.176E+08	3.110E+06	2.562E+09	6.488E+08	2.759E-02	0.	1.245E+04	2.638E+04	IIII	9.875E+03
	2.250E+07	3.002E+06	8.956E+08	1.753E+04						
K =11	2.510E+07	9.152E-14	1.400E+04	1.865E+09	0.	0.	3.265E+08	1.000E+00	7.285E+08	2.354E+08
	1.618E+07	8.659E+05	1.111E+09	4.617E+08	1.592E-02	0.	1.400E+04	2.263E+03	IIII	6.571E+03
	2.770E+07	1.305E+06	2.920E+08	2.811E+04						
K =12	3.120E+07	2.814E-14	1.399E+04	5.258E+08	0.	0.	8.086E+07	1.000E+00	3.263E+08	5.499E+07
	3.301E+06	3.263E+05	2.601E+08	1.927E+08	5.853E-03	0.	1.399E+04	2.405E+02	IIII	1.655E+03
	3.470E+07	1.012E+06	7.308E+07	3.530E+04						
K =13	3.970E+07	7.500E-15	1.311E+04	1.021E+08	0.	0.	1.349E+07	1.000E+00	1.367E+08	1.323E+07
	6.777E+05	1.154E+05	3.558E+07	5.461E+07	1.100E-03	0.	1.311E+04	2.095E+01	IIII	1.495E+02
	4.470E+07	1.134E+06	1.191E+07	2.478E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (5, 1) = 5

K	HC O2 (HTUP)0	RHO END HE	T ELECT ENP M+	ENE UP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 DAMB
K = 1	9,350E+06	1,732E-09	1,021E+03	1,688E+11	0,	0,	9,041E+10	6,818E+09	2,412E+11	2,831E+13
	7,488E+12	6,257E+07	2,734E+03	1,570E+09	1,799E+00	0,	1,021E+03	1,161E+10	IIII	4,614E+02
	9,700E+06	1,678E+09	1,672E+11	3,541E+02						
K = 2	1,000E+07	5,410E-10	1,093E+03	6,641E+10	0,	0,	3,530E+10	3,384E+09	4,991E+11	8,832E+12
	2,120E+12	6,538E+07	5,952E+03	2,584E+09	8,583E-01	0,	1,093E+03	3,623E+09	IIII	5,810E+03
	1,030E+07	5,237E+08	6,383E+10	5,315E+02						
K = 3	1,063E+07	1,916E-10	1,560E+03	6,528E+10	0,	0,	3,430E+10	4,315E+09	5,042E+11	3,097E+12
	5,664E+11	5,489E+07	2,595E+04	5,313E+09	9,709E-01	0,	1,560E+03	1,056E+09	IIII	6,696E+03
	1,095E+07	1,836E+08	5,997E+10	1,622E+03						
K = 4	1,132E+07	6,074E-11	1,725E+03	2,842E+10	0,	0,	1,637E+10	2,966E+09	2,745E+11	1,041E+12
	1,363E+11	4,100E+07	3,654E+08	3,121E+09	5,856E-01	0,	1,725E+03	2,610E+08	IIII	7,047E+03
	1,170E+07	6,172E+07	2,493E+10	2,745E+03						
K = 5	1,210E+07	2,273E-11	1,864E+03	1,207E+10	0,	0,	6,509E+09	9,707E+08	1,146E+11	3,640E+11
	3,617E+10	2,979E+07	7,123E+08	1,348E+09	2,747E-01	0,	1,864E+03	4,834E+07	IIII	6,024E+03
	1,250E+07	2,366E+07	1,001E+10	3,667E+03						
K = 6	1,295E+07	9,206E-12	3,645E+03	1,759E+10	0,	0,	5,734E+09	1,000E+00	4,846E+10	1,392E+11
	1,153E+10	2,387E+07	5,113E+09	1,767E+09	1,762E-01	0,	3,645E+03	1,299E+07	IIII	5,121E+03
	1,340E+07	1,726E+07	1,071E+10	5,448E+03						
K = 7	1,405E+07	3,972E-12	1,085E+04	5,038E+10	0,	0,	9,650E+09	1,000E+00	1,205E+10	3,606E+10
	2,222E+09	1,229E+07	2,894E+10	4,656E+09	2,571E-01	0,	1,085E+04	2,379E+06	IIII	5,430E+03
	1,470E+07	8,319E+06	1,678E+10	1,192E+04						
K = 8	1,550E+07	1,729E-12	1,427E+04	5,092E+10	0,	0,	5,370E+09	1,000E+00	3,359E+09	2,931E+09
	1,366E+08	2,021E+06	3,685E+10	8,024E+09	1,833E-01	0,	1,427E+04	1,348E+05	IIII	6,465E+03
	1,630E+07	1,267E+06	6,045E+09	9,576E+03						
K = 9	1,760E+07	7,182E-13	1,399E+04	2,286E+10	0,	0,	2,032E+09	1,000E+00	1,389E+09	6,032E+08
	3,146E+07	1,020E+06	1,613E+10	4,572E+09	8,373E-02	0,	1,399E+04	1,818E+04	IIII	8,373E+03
	1,890E+07	5,319E+05	2,164E+09	1,065E+04						
K =10	2,070E+07	2,668E-13	1,406E+04	9,757E+09	0,	0,	2,947E+08	1,000E+00	3,907E+08	1,210E+07
	5,406E+05	8,124E+04	6,579E+09	2,680E+09	4,093E-02	0,	1,406E+04	2,178E+02	IIII	9,875E+03
	2,250E+07	2,475E+04	4,980E+08	1,524E+04						
K =11	2,510E+07	9,152E-14	1,429E+04	3,260E+09	0,	0,	9,477E+07	1,000E+00	2,002E+08	3,292E+06
	1,470E+05	3,917E+04	1,945E+09	1,158E+09	1,921E-02	0,	1,429E+04	3,184E+01	IIII	6,571E+03
	2,770E+07	1,818E+04	1,565E+08	2,600E+04						
K =12	3,120E+07	2,814E-14	1,518E+04	8,852E+08	0,	0,	3,836E+07	1,000E+00	1,455E+08	2,923E+06
	1,245E+05	3,243E+04	4,319E+08	4,051E+08	1,038E-02	0,	1,518E+04	1,290E+01	IIII	1,655E+03
	3,470E+07	5,381E+04	4,810E+07	5,761E+04						
K =13	3,970E+07	7,500E-15	1,479E+04	1,522E+08	0,	0,	1,321E+07	1,000E+00	1,041E+08	4,800E+06
	2,152E+05	5,087E+04	5,209E+07	8,749E+07	1,998E-03	0,	1,479E+04	7,600E+00	IIII	1,495E+02
	4,470E+07	4,115E+05	1,262E+07	4,444E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0.00

COLUMN (6, 1) = 6

	HC O2 (HTOP)O	RHO FNO HE	T ELECT ENP M+	FNE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	FN2D CO2	O	N2 GAMB
K = 1	9.350E+06	1.732E-09	1.296E+03	3.582E+11	0.	0.	1.919E+11	1.447E+10	1.566E+11	2.816E+13
	7.436E+12	6.225E+07	5.804E+03	3.333E+09	2.672E+00	0.	1.296E+03	1.155E+10	IIII	4.614E+02
	9.700E+06	1.670E+09	3.548E+11	5.200E+02						
K = 2	1.000E+07	5.410E-10	1.606E+03	1.979E+11	0.	0.	1.052E+11	1.008E+10	7.780E+11	8.730E+12
	1.915E+12	6.462E+07	1.774E+04	7.699E+09	2.358E+00	0.	1.606E+03	3.582E+09	IIII	5.810E+03
	1.030E+07	5.176E+08	1.902E+11	1.428E+03						
K = 3	1.065E+07	1.916E-10	3.367E+03	3.389E+11	0.	0.	3.031E+11	8.726E+10	7.284E+11	2.795E+12
	3.399E+11	5.330E+07	4.483E+10	2.718E+10	3.770E+00	0.	3.367E+03	9.527E+08	IIII	6.696E+03
	1.095E+07	1.657E+08	2.669E+11	5.696E+03						
K = 4	1.132E+07	6.474E-11	4.900E+03	2.334E+11	0.	0.	2.225E+11	6.471E+10	2.935E+11	8.136E+11
	4.631E+10	4.035E+07	4.628E+10	2.156E+10	2.240E+00	0.	4.900E+03	2.040E+08	IIII	7.047E+03
	1.170E+07	4.824E+07	1.630E+11	8.998E+03						
K = 5	1.210E+07	2.273E-11	1.062E+04	2.912E+11	0.	0.	1.123E+11	1.000E+00	2.922E+10	1.812E+11
	5.156E+09	2.117E+07	1.284E+11	1.961E+10	1.450E+00	0.	1.062E+04	2.406E+07	IIII	6.024E+03
	1.250E+07	1.178E+07	1.432E+11	1.197E+04						
K = 6	1.295E+07	9.206E-12	1.302E+04	3.558E+11	0.	0.	5.550E+09	1.000E+00	2.165E+09	6.390E+08
	5.947E+06	1.873E+05	2.739E+11	6.266E+10	1.119E+00	0.	1.302E+04	5.965E+04	IIII	5.121E+03
	1.340E+07	7.927E+04	1.916E+10	9.548E+03						
K = 7	1.405E+07	3.972E-12	1.161E+04	1.654E+11	0.	0.	1.000E+00	1.000E+00	1.000E+00	1.000E+00
	1.000E+00	1.000E+00	1.275E+11	3.794E+10	5.301E-01	0.	1.161E+04	1.000E+00	IIII	5.430E+03
	1.470E+07	1.000E+00	1.000E+00	1.161E+04						
K = 8	1.550E+07	1.729E-12	1.161E+04	7.184E+10	0.	0.	1.000E+00	1.000E+00	1.000E+00	1.000E+00
	1.000E+00	1.000E+00	5.413E+10	1.770E+10	2.302E-01	0.	1.161E+04	1.000E+00	IIII	6.465E+03
	1.630E+07	1.000E+00	1.000E+00	1.161E+04						
K = 9	1.760E+07	7.182E-13	1.161E+04	2.972E+10	0.	0.	1.000E+00	1.000E+00	1.000E+00	1.000E+00
	1.000E+00	1.000E+00	2.153E+10	8.190E+09	9.523E-02	0.	1.161E+04	1.000E+00	IIII	8.373E+03
	1.890E+07	1.000E+00	1.000E+00	1.161E+04						
K =10	2.070E+07	2.668E-13	1.161E+04	1.097E+10	0.	0.	1.000E+00	1.000E+00	1.000E+00	1.000E+00
	1.000E+00	1.000E+00	7.396E+09	3.570E+09	3.514E-02	0.	1.161E+04	1.000E+00	IIII	9.875E+03
	2.250E+07	1.000E+00	1.000E+00	1.161E+04						
K =11	2.510E+07	9.152E-14	1.161E+04	3.719E+09	0.	0.	1.000E+00	1.000E+00	1.000E+00	1.000E+00
	1.000E+00	1.000E+00	2.203E+09	1.515E+09	1.192E-02	0.	1.161E+04	1.000E+00	IIII	6.571E+03
	2.770E+07	1.000E+00	1.000E+00	1.161E+04						
K =12	3.120E+07	2.814E-14	1.313E+04	1.067E+09	0.	0.	6.569E+06	6.381E+05	3.201E+07	1.353E+04
	4.326E+02	1.933E+03	4.998E+08	5.498E+08	1.072E-02	0.	1.313E+04	7.031E-01	IIII	1.655E+03
	3.470E+07	2.498E+02	1.724E+07	5.757E+04						
K =13	3.970E+07	7.500E-15	1.527E+04	1.778E+08	0.	0.	1.120E+07	1.000E+00	8.682E+07	2.387E+06
	9.749E+04	2.838E+04	6.013E+07	1.063E+08	2.566E-03	0.	1.527E+04	3.780E+00	IIII	1.495E+02
	4.470E+07	2.047E+05	1.142E+07	5.699E+04						

UUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 1,000000E-03 TTX= 9,764000E+00 DSMALL= 1,057876E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349990E+06	1,731905E-09	-1,100736E+00	2,925279E+23	1,265943E+09	1,096247E+00	1,253414E-05	9,699999E+06	-2,201472E+00
2	1,000001E+07	5,409503E-10	1,043265E+01	2,512484E+23	1,357764E+09	3,672415E-01	0.	1,030001E+07	2,306677E+01
3	1,062501E+07	1,915982E-10	1,545400E+01	2,727028E+23	1,554266E+09	1,486973E-01	1,059486E-05	1,095000E+07	7,641237E+00
4	1,132500E+07	6,473561E-11	5,570069E+00	3,153403E+23	2,045921E+09	6,622199E-02	1,224111E-06	1,170000E+07	3,298901E+00
5	1,210006E+07	2,272662E-11	1,114044E+02	3,372142E+23	3,042040E+09	3,456764E-02	0.	1,250011E+07	2,195100E+02
6	1,295015E+07	9,205580E-12	3,035732E+02	3,803443E+23	4,168978E+09	1,918893E-02	0.	1,340019E+07	3,670364E+02
7	1,405016E+07	3,972631E-12	3,171648E+02	5,511658E+23	5,165490E+09	1,026029E-02	3,684455E-06	1,470012E+07	2,460931E+02
8	1,550012E+07	1,729069E-12	2,340528E+02	6,814140E+23	6,441066E+09	5,568267E-03	3,091109E-07	1,630011E+07	2,214125E+02
9	1,760005E+07	7,181639E-13	1,063222E+02	1,114396E+24	8,061960E+09	2,894992E-03	1,366767E-06	1,890000E+07	-6,766184E+00
10	2,070004E+07	2,666316E-13	7,622604E+01	1,557765E+24	1,199481E+10	1,600297E-03	0.	2,250006E+07	1,652243E+02
11	2,510005E+07	9,152067E-14	9,497626E+01	2,280227E+24	1,803641E+10	8,253539E-04	1,577747E-07	2,770001E+07	2,472826E+01
12	3,120053E+07	2,613276E-14	6,660677E+02	3,126692E+24	3,659106E+10	5,147037E-04	0.	3,470065E+07	1,307407E+03
13	3,970061E+07	7,499409E-15	1,612207E+03	4,580816E+24	5,815836E+10	2,180793E-04	0.	4,470096E+07	1,917007E+03

UUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 2,000000E-03 TTX= 9,772000E+00 DSMALL= 9,857667E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349999E+06	1,731908E-09	-2,286073E+00	2,925274E+23	1,281240E+09	1,109495E+00	2,618937E-05	9,699998E+06	-4,572147E+00
2	1,000002E+07	5,409243E-10	3,135247E+01	2,512581E+23	1,413437E+09	3,822847E-01	0.	1,030003E+07	6,727709E+01
3	1,062500E+07	1,916141E-10	5,747201E+00	2,726802E+23	1,608002E+09	1,540579E-01	8,740123E-05	1,094997E+07	-5,575269E+01
4	1,132501E+07	6,472933E-11	1,471940E+01	3,153709E+23	2,374722E+09	7,685707E-02	0.	1,170004E+07	8,522235E+01
5	1,210017E+07	2,272241E-11	3,413710E+02	3,372767E+23	3,738003E+09	4,246822E-02	0.	1,250030E+07	5,975194E+02
6	1,295030E+07	9,205363E-12	6,026223E+02	3,803111E+23	4,802015E+09	2,210459E-02	0.	1,340030E+07	6,077249E+02
7	1,405028E+07	3,972667E-12	5,184725E+02	5,511580E+23	5,887128E+09	1,169366E-02	4,969538E-06	1,470021E+07	4,292207E+02
8	1,550020E+07	1,729009E-12	3,981443E+02	6,814063E+23	7,262133E+09	6,278146E-03	8,189277E-07	1,630018E+07	3,670686E+02
9	1,760000E+07	7,182556E-13	-7,211572E+00	1,114284E+24	9,099102E+09	3,267741E-03	4,753795E-06	1,889981E+07	-3,014914E+02
10	2,070000E+07	2,666096E-13	2,681179E+00	1,557893E+24	1,873116E+10	2,498826E-03	0.	2,250019E+07	3,665941E+02
11	2,510029E+07	9,151628E-14	5,739371E+02	2,280342E+24	3,420372E+10	1,565098E-03	0.	2,770035E+07	7,610200E+02
12	3,120119E+07	2,812876E-14	2,379102E+03	3,127137E+24	7,161072E+10	1,007160E-03	0.	3,470200E+07	3,997164E+03
13	3,970191E+07	7,499833E-15	3,824759E+03	4,580613E+24	9,235972E+10	3,463412E-04	4,878945E-08	4,470183E+07	3,652334E+03

UUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 3,000000E-03 TTX= 9,780000E+00 DSMALL= 8,463360E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,350003E+06	1,731888E-09	5,625451E+00	2,925307E+23	1,325340E+09	1,147670E+00	0.	9,700006E+06	1,125090E+01
2	1,000002E+07	5,409340E-10	4,158972E+01	2,512558E+23	1,509725E+09	4,083310E-01	0.	1,030004E+07	7,192854E+01
3	1,062499E+07	1,916233E-10	-2,100903E+01	2,726670E+23	1,869007E+09	1,790727E-01	1,424706E-04	1,094994E+07	-1,139466E+02
4	1,132510E+07	6,470863E-11	1,963561E+02	3,154718E+23	3,301945E+09	1,066322E-01	0.	1,170025E+07	5,066589E+02
5	1,210047E+07	2,271758E-11	9,319631E+02	3,373483E+23	5,142914E+09	5,841729E-02	0.	1,250068E+07	1,357267E+03
6	1,295059E+07	9,208276E-12	1,176601E+03	3,802329E+23	6,089599E+09	2,803735E-02	2,380392E-05	1,340050E+07	9,459347E+02
7	1,405043E+07	3,972847E-12	8,538049E+02	5,511359E+23	7,555786E+09	1,500899E-02	8,966175E-06	1,470036E+07	7,116851E+02
8	1,550035E+07	1,728990E-12	6,976079E+02	6,814139E+23	9,600463E+09	8,472449E-03	3,907545E-07	1,630034E+07	6,635308E+02
9	1,759960E+07	7,185643E-13	-8,042795E+02	1,113806E+24	1,317078E+10	4,732027E-03	2,301254E-05	1,889685E+07	-2,292090E+03
10	2,069985E+07	2,666911E-13	-3,060403E+02	1,555658E+24	4,990204E+10	6,654213E-03	0.	2,250084E+07	1,680009E+03
11	2,510208E+07	9,147537E-14	4,164633E+03	2,281362E+24	1,048222E+11	4,794324E-03	0.	2,770332E+07	6,649258E+03
12	3,120449E+07	2,812562E-14	8,979282E+03	3,127486E+24	1,609077E+11	2,262815E-03	0.	3,470565E+07	1,130931E+04
13	3,970464E+07	7,501167E-15	9,277796E+03	4,579798E+24	1,632019E+11	6,121023E-04	1,065049E-06	4,470362E+07	7,246285E+03

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 4,000000E-03 TTX= 9,788000E+00 DSMALL= 6,002554E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,350028E+06	1,731765E-09	5,527768E+01	2,925515E+23	1,486775E+09	1,287372E+00	0,	9,700055E+06	1,105554E+02
2	9,999987E+06	5,410844E-10	-2,536629E+01	2,511861E+23	1,745004E+09	4,720833E-01	5,692130E-04	1,029992E+07	-1,613279E+02
3	1,062497E+07	1,915661E-10	-5,993836E+01	2,727485E+23	3,078897E+09	2,949091E-01	0,	1,095002E+07	4,145122E+01
4	1,132563E+07	6,465081E-11	1,253859E+03	3,156516E+23	6,464003E+09	2,088869E-01	0,	1,170123E+07	2,466267E+03
5	1,210128E+07	2,272705E-11	2,556289E+03	3,372078E+23	8,411883E+09	9,558863E-02	0,	1,250132E+07	2,646312E+03
6	1,295121E+07	9,206642E-12	2,428165E+03	3,802178E+23	1,045414E+10	4,813421E-02	3,740840E-05	1,340111E+07	2,210018E+03
7	1,405037E+07	3,976882E-12	7,493722E+02	5,505767E+23	1,356588E+10	2,697495E-02	1,263815E-04	1,469964E+07	-7,112737E+02
8	1,549982E+07	1,723602E-12	-3,630962E+02	6,815667E+23	3,011445E+10	2,602794E-02	0,	1,629099E+07	-1,651864E+01
9	1,759911E+07	7,180341E-13	-1,771007E+03	1,113690E+24	6,662049E+10	2,393805E-02	6,073644E-05	1,889824E+07	-3,525495E+03
10	2,070245E+07	2,661382E-13	5,909347E+03	1,561823E+24	2,065088E+11	2,747994E-02	0,	2,250767E+07	1,534419E+04
11	2,511111E+07	9,134568E-14	2,222298E+04	2,283351E+24	3,477154E+11	1,588984E-02	0,	2,771155E+07	2,910177E+04
12	3,121582E+07	2,812360E-14	3,164777E+04	3,127688E+24	4,159827E+11	5,649508E-03	0,	3,471710E+07	3,419376E+04
13	3,971201E+07	7,507116E-15	2,402188E+04	4,576169E+24	2,934605E+11	1,101521E-03	7,511907E-06	4,470692E+07	1,385000E+04

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 5,000000E-03 TTX= 9,797000E+00 DSMALL= 2,634067E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,350068E+06	1,731563E-09	1,368831E+02	2,925856E+23	2,077573E+09	1,798724E+00	0,	9,700137E+06	2,737661E+02
2	9,999706E+06	5,417409E-10	-5,886173E+02	2,508817E+23	3,175461E+09	8,601387E-01	4,939762E-03	1,029927E+07	-1,451001E+03
3	1,062551E+07	1,908678E-10	1,027542E+03	2,737463E+23	1,011510E+10	9,653231E-01	0,	1,095175E+07	3,506065E+03
4	1,132797E+07	6,452537E-11	5,940677E+03	3,163678E+23	1,806113E+10	5,827006E-01	0,	1,170419E+07	8,375270E+03
5	1,210372E+07	2,275615E-11	7,436090E+03	3,367766E+23	2,418377E+10	2,751647E-01	6,109864E-04	1,250325E+07	6,496911E+03
6	1,294838E+07	9,307119E-12	-3,243877E+03	3,761948E+23	3,849122E+10	1,791212E-01	3,434933E-03	1,339352E+07	-1,290466E+04
7	1,405118E+07	3,926103E-12	2,366175E+03	5,576977E+23	1,286876E+11	2,526203E-01	0,	1,470865E+07	1,769701E+04
8	1,551493E+07	1,715856E-12	2,985786E+04	6,866297E+23	2,111774E+11	1,811750E-01	0,	1,632101E+07	4,201870E+04
9	1,761765E+07	7,198632E-13	3,569771E+04	1,111796E+24	2,334714E+11	8,403373E-02	4,016434E-04	1,891409E+07	2,937672E+04
10	2,071468E+07	2,668269E-13	2,936672E+04	1,557792E+24	3,067461E+11	4,092405E-02	0,	2,251468E+07	2,935673E+04
11	2,511369E+07	9,155078E-14	2,737366E+04	2,279482E+24	4,197806E+11	1,921562E-02	1,941264E-05	2,771270E+07	2,539060E+04
12	3,122160E+07	2,806219E-14	4,319010E+04	3,134555E+24	7,370728E+11	1,034194E-02	0,	3,473049E+07	6,096960E+04
13	3,972175E+07	7,512406E-15	4,349669E+04	4,572946E+24	5,332678E+11	2,003062E-03	1,747794E-05	4,471300E+07	2,600378E+04

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 1,0

KCYC= 2 TIMDEL= 1,000000E-03 TIMTOT= 6,000000E-03 TTX= 9,805000E+00 DSMALL= 1,380886E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349864E+06	1,732575E-09	-2,715842E+02	2,924147E+23	3,086428E+09	2,673734E+00	4,855203E-03	9,699728E+06	-5,431664E+02
2	9,998055E+06	5,440000E-10	-3,890572E+03	2,498399E+23	8,743486E+09	2,378228E+00	3,258059E-02	1,029658E+07	-7,237976E+03
3	1,062737E+07	1,881250E-10	4,749775E+03	2,777375E+23	3,899270E+10	3,667750E+00	0,	1,095837E+07	1,673753E+04
4	1,133487E+07	6,447557E-11	1,973729E+04	3,166122E+23	6,907249E+10	2,226744E+00	0,	1,171137E+07	2,273705E+04
5	1,211171E+07	2,270971E-11	2,341225E+04	3,374653E+23	1,275650E+11	1,446462E+00	0,	1,251204E+07	2,406745E+04
6	1,297769E+07	8,896382E-12	5,537544E+04	3,935633E+23	2,389102E+11	1,062718E+00	0,	1,344333E+07	8,660343E+04
7	1,409035E+07	3,990220E-12	8,070306E+04	5,487362E+23	2,675104E+11	5,337127E-01	2,229245E-03	1,473737E+07	7,474270E+04
8	1,555302E+07	1,738265E-12	6,603145E+04	6,777777E+23	2,669969E+11	2,320557E-01	1,437710E-03	1,632866E+07	5,732019E+04
9	1,762473E+07	7,202741E-13	4,946508E+04	1,111162E+24	2,656037E+11	9,565373E-02	5,322389E-04	1,892060E+07	4,160994E+04
10	2,071827E+07	2,672002E-13	3,653104E+04	1,555616E+24	2,635598E+11	3,521162E-02	1,247133E-04	2,251573E+07	3,145211E+04
11	2,510853E+07	9,177144E-14	1,705195E+04	2,274002E+24	2,607603E+11	1,196517E-02	1,269697E-04	2,770133E+07	2,651794E+03
12	3,121549E+07	2,802063E-14	3,096755E+04	3,134204E+24	7,608239E+11	1,065938E-02	0,	3,472906E+07	5,432330E+04
13	3,972325E+07	7,508853E-15	4,650874E+04	4,575110E+24	6,848050E+11	2,571050E-03	1,412338E-05	4,471665E+07	3,369418E+04

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,67E+02	4,67E+02	3,83E+06	2,50E+09	1,22E+09	3,40E+11	2,84E+13	7,52E+12	7,53E+08	1,00E+00	1,00E+00	1,10E+00	218,6	218,6
2	5,70E+02	5,70E+02	4,67E+06	2,83E+09	1,28E+09	4,50E+11	8,88E+12	2,18E+12	8,89E+08	1,00E+00	1,88E+00	3,73E-01	230,9	230,9
3	6,07E+02	6,07E+02	5,29E+06	1,45E+09	7,18E+08	3,41E+11	3,15E+12	6,81E+11	5,31E+08	1,00E+00	1,61E+01	1,52E-01	258,5	258,5
4	6,35E+02	6,35E+02	7,57E+06	6,28E+08	3,71E+08	1,61E+11	1,06E+12	2,07E+11	2,17E+08	1,00E+00	4,20E+05	6,77E-02	334,8	334,8
5	7,40E+02	7,40E+02	2,14E+07	4,73E+08	3,23E+08	6,55E+10	3,73E+11	6,94E+10	1,08E+08	1,00E+00	1,44E+07	3,54E-02	494,1	494,1
6	7,93E+02	7,93E+02	3,18E+07	2,64E+08	2,00E+08	3,34E+10	1,50E+11	2,53E+10	4,89E+07	1,00E+00	2,85E+07	1,96E-02	665,0	664,9
7	6,89E+02	6,89E+02	1,36E+07	6,80E+07	5,06E+07	1,85E+10	6,37E+10	9,79E+09	2,42E+07	5,18E+03	1,12E+07	1,03E-02	808,1	808,1
8	7,71E+02	7,71E+02	1,38E+07	4,61E+07	3,31E+07	1,01E+10	2,70E+10	3,77E+09	1,75E+07	2,43E+05	1,11E+07	5,62E-03	982,8	982,8
9	9,11E+02	9,11E+02	1,61E+07	2,89E+07	1,83E+07	5,48E+09	1,07E+10	1,34E+09	1,21E+07	3,18E+06	9,66E+06	2,94E-03	1188,3	1188,3
10	1,64E+03	1,64E+03	4,69E+07	4,56E+07	2,61E+07	2,76E+09	3,64E+09	3,92E+08	7,02E+06	2,62E+07	1,67E+07	1,67E-03	1662,3	1662,3
11	2,44E+03	2,44E+03	4,44E+07	3,11E+07	1,17E+07	1,30E+09	1,06E+09	9,75E+07	3,38E+06	2,86E+07	1,32E+07	8,48E-04	2293,3	2293,3
12	4,77E+03	4,77E+03	4,45E+07	2,00E+07	5,69E+06	5,43E+08	2,34E+08	1,77E+07	1,17E+06	2,51E+07	1,57E+07	5,22E-04	4024,9	4024,7
13	6,76E+03	6,76E+03	1,95E+07	4,91E+06	7,34E+05	1,88E+08	3,60E+07	2,14E+06	2,80E+05	7,17E+06	9,93E+06	2,19E-04	5671,4	5671,3

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,29E+02	5,29E+02	4,28E+06	5,75E+09	2,12E+09	3,42E+11	2,84E+13	7,52E+12	1,49E+09	1,00E+00	1,00E+00	1,12E+00	221,2	221,2
2	6,63E+02	6,63E+02	5,38E+06	6,50E+09	2,14E+09	4,53E+11	8,88E+12	2,18E+12	1,75E+09	1,00E+00	1,90E+00	3,95E-01	240,1	240,1
3	6,37E+02	6,37E+02	5,59E+06	1,88E+09	8,86E+08	3,42E+11	3,14E+12	6,80E+11	6,60E+08	1,00E+00	1,70E+01	1,56E-01	267,3	267,3
4	7,42E+02	7,42E+02	1,08E+07	1,36E+09	7,10E+08	1,54E+11	1,06E+12	2,05E+11	4,13E+08	1,00E+00	1,19E+06	8,00E-02	387,8	387,8
5	8,91E+02	8,91E+02	4,14E+07	1,06E+09	6,15E+08	6,59E+10	3,72E+11	6,81E+10	2,07E+08	1,00E+00	3,26E+07	4,43E-02	604,9	604,8
6	8,41E+02	8,41E+02	4,01E+07	3,55E+08	2,54E+08	3,45E+10	1,50E+11	2,47E+10	5,94E+07	1,84E+00	3,66E+07	2,26E-02	763,8	763,8
7	8,14E+02	8,14E+02	2,60E+07	1,31E+08	1,03E+08	1,86E+10	6,36E+10	9,55E+09	2,72E+07	1,95E+04	2,35E+07	1,19E-02	917,9	916,0
8	9,59E+02	9,59E+02	3,07E+07	8,39E+07	6,73E+07	1,03E+10	2,70E+10	3,66E+09	1,79E+07	1,89E+06	2,31E+07	6,45E-03	1103,7	1103,7
9	1,16E+03	1,16E+03	3,19E+07	6,02E+07	4,48E+07	5,56E+09	1,07E+10	1,30E+09	1,21E+07	6,61E+06	2,09E+07	3,36E-03	1334,6	1334,7
10	2,79E+03	2,79E+03	1,43E+08	1,24E+08	7,11E+07	2,82E+09	3,54E+09	3,53E+08	6,68E+06	9,55E+07	3,94E+07	2,72E-03	2502,4	2502,3
11	4,41E+03	4,41E+03	1,30E+08	8,51E+07	3,28E+07	1,31E+09	4,92E+08	8,45E+07	3,13E+06	9,30E+07	3,36E+07	1,63E-03	4068,6	4068,6
12	7,40E+03	7,40E+03	9,84E+07	4,11E+07	1,53E+07	5,28E+08	2,02E+08	1,45E+07	1,16E+06	5,74E+07	3,59E+07	1,03E-03	7252,3	7251,4
13	8,63E+03	8,63E+03	3,31E+07	7,79E+06	1,61E+06	1,80E+08	3,10E+07	1,79E+06	2,62E+05	1,23E+07	1,72E+07	3,48E-04	8590,2	8590,3

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6,34E+02	6,34E+02	4,98E+06	1,65E+10	3,14E+09	3,49E+11	2,84E+13	7,52E+12	3,39E+09	1,00E+00	1,00E+00	1,17E+00	228,7	228,7
2	7,69E+02	7,69E+02	6,10E+06	1,32E+10	2,81E+09	4,56E+11	8,87E+12	2,17E+12	3,05E+09	1,00E+00	1,94E+00	4,32E-01	256,1	256,1
3	7,55E+02	7,55E+02	6,80E+06	4,32E+09	1,59E+09	3,50E+11	3,14E+12	6,75E+11	1,33E+09	1,00E+00	2,72E+01	1,84E-01	310,0	310,0
4	9,38E+02	9,38E+02	1,89E+07	3,62E+09	1,38E+09	1,74E+11	1,06E+12	2,00E+11	9,75E+08	1,00E+00	4,49E+06	1,15E-01	536,5	536,4
5	1,05E+03	1,05E+03	7,14E+07	1,98E+09	9,25E+08	7,13E+10	3,71E+11	6,55E+10	3,90E+08	1,00E+00	6,11E+07	6,18E-02	827,1	826,8
6	8,96E+02	8,96E+02	5,18E+07	4,73E+08	3,18E+08	3,67E+10	1,50E+11	2,36E+10	7,54E+07	9,81E+00	4,78E+07	2,87E-02	963,2	963,3
7	1,07E+03	1,07E+03	6,61E+07	3,06E+08	2,33E+08	1,98E+10	6,35E+10	9,02E+09	3,39E+07	2,17E+05	5,64E+07	1,56E-02	1169,1	1169,2
8	1,49E+03	1,49E+03	1,46E+08	1,92E+08	1,58E+08	1,11E+10	2,68E+10	3,27E+09	1,66E+07	2,77E+07	6,24E+07	9,80E-03	1456,3	1456,3
9	2,00E+03	2,00E+03	1,40E+08	1,93E+08	1,40E+08	5,81E+09	1,05E+10	1,16E+09	1,18E+07	5,68E+07	6,18E+07	5,25E-03	1866,7	1867,2
10	6,07E+03	6,07E+03	5,49E+08	4,74E+08	1,65E+08	3,01E+09	3,13E+09	2,34E+08	7,51E+06	4,32E+08	1,06E+08	7,36E-03	5971,9	5970,3
11	9,79E+03	9,79E+03	4,39E+08	2,61E+08	1,01E+08	1,29E+09	7,50E+08	5,04E+07	8,83E+06	3,21E+08	1,14E+08	4,99E-03	10764,1	10761,5
12	1,22E+04	1,22E+04	2,10E+08	7,71E+07	3,34E+07	4,93E+08	1,41E+08	9,19E+06	2,01E+06	1,23E+08	8,13E+07	2,30E-03	14823,6	14821,0
13	1,14E+04	1,14E+04	5,67E+07	1,20E+07	3,26E+06	1,67E+08	2,30E+07	1,26E+06	2,57E+05	2,13E+07	3,06E+07	6,15E-04	14434,8	14436,2

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	8.36E+02	8.36E+02	6.27E+06	5.84E+10	1.71E+09	3.75E+11	2.84E+13	7.50E+12	8.17E+09	1.00E+00	1.00E+00	1.38E+00	255.8	255.8
2	9.21E+02	9.21E+02	7.13E+06	2.72E+10	2.78E+09	4.73E+11	8.87E+12	2.16E+12	5.23E+09	1.00E+00	2.04E+00	5.18E-01	295.1	295.1
3	1.05E+03	1.05E+03	9.82E+06	1.54E+10	2.59E+09	3.88E+11	3.14E+12	6.55E+11	3.71E+09	1.00E+00	3.70E+02	3.25E-01	506.9	506.9
4	1.39E+03	1.39E+03	4.31E+07	1.21E+10	2.02E+09	2.07E+11	1.05E+12	1.82E+11	3.54E+09	1.00E+00	1.87E+07	2.34E-01	1036.0	1035.1
5	1.14E+03	1.14E+03	1.02E+08	2.65E+09	1.05E+09	8.49E+10	3.71E+11	5.83E+10	7.01E+08	1.00E+00	9.20E+07	1.00E-01	1336.1	1336.0
6	1.36E+03	1.36E+03	1.61E+08	1.60E+09	7.98E+08	4.28E+10	1.49E+11	2.04E+10	2.18E+08	4.99E+02	1.48E+08	5.09E-02	1625.2	1625.4
7	2.00E+03	2.00E+03	2.48E+08	1.44E+09	7.24E+08	2.30E+10	6.26E+10	7.40E+09	5.69E+07	3.13E+06	1.90E+08	3.03E-02	2043.9	2045.1
8	4.99E+03	4.99E+03	8.84E+08	2.60E+09	6.78E+08	1.45E+10	2.48E+10	1.63E+09	5.04E+07	4.91E+08	2.72E+08	3.42E-02	4107.1	4106.6
9	8.22E+03	8.22E+03	1.70E+09	2.32E+09	5.57E+08	7.08E+09	8.50E+09	4.21E+08	8.95E+07	1.40E+09	2.86E+08	2.74E-02	7957.7	7960.4
10	1.60E+04	1.60E+04	3.00E+09	1.78E+09	6.01E+08	2.89E+09	1.24E+09	1.57E+07	4.58E+07	2.41E+09	5.66E+08	2.88E-02	17526.5	17503.5
11	2.26E+04	2.26E+04	1.55E+09	4.69E+08	2.07E+08	1.04E+09	2.07E+08	4.44E+06	9.66E+06	1.09E+09	4.51E+08	1.62E-02	28110.3	28091.2
12	2.30E+04	2.30E+04	4.52E+08	1.05E+08	5.21E+07	3.96E+08	5.19E+07	2.69E+06	1.87E+06	2.59E+08	1.92E+08	5.91E-03	35299.8	35292.5
13	1.53E+04	1.53E+04	9.51E+07	1.55E+07	5.33E+06	1.44E+08	1.31E+07	6.61E+05	2.13E+05	3.56E+07	5.46E+07	1.11E-03	24778.7	24790.9

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.20E+03	1.20E+03	8.60E+06	1.93E+11	1.76E+07	4.84E+11	2.83E+13	7.44E+12	1.34E+10	1.00E+00	1.00E+00	2.14E+00	354.1	354.1
2	1.29E+03	1.29E+03	9.59E+06	7.63E+10	7.90E+08	5.97E+11	8.85E+12	2.10E+12	1.11E+10	1.00E+00	2.71E+00	9.98E-01	531.5	531.9
3	1.91E+03	1.91E+03	3.31E+07	3.70E+10	4.01E+08	6.39E+11	3.10E+12	5.10E+11	3.63E+10	1.00E+00	5.40E+03	1.17E+00	1622.0	1618.9
4	2.09E+03	2.09E+03	8.18E+07	1.81E+10	1.05E+09	3.34E+11	1.04E+12	1.10E+11	1.90E+10	1.00E+00	3.93E+07	6.76E-01	2795.4	2790.8
5	2.37E+03	2.37E+03	3.05E+08	1.14E+10	1.36E+09	1.35E+11	3.64E+11	3.12E+10	5.17E+09	2.16E+00	2.76E+08	3.04E-01	3666.8	3668.9
6	5.62E+03	5.62E+03	6.27E+08	1.94E+10	1.40E+09	7.56E+10	1.39E+11	4.57E+09	1.31E+09	9.73E+07	3.59E+08	2.24E-01	5447.9	5477.6
7	1.27E+04	1.27E+04	2.09E+10	5.02E+10	1.78E+10	3.22E+10	1.81E+10	1.00E+00	4.40E+08	1.98E+10	2.98E+08	2.86E-01	11922.2	11852.3
8	1.19E+04	1.19E+04	4.32E+10	1.04E+10	4.39E+09	1.01E+10	1.16E+09	1.00E+00	2.54E+06	3.56E+10	6.66E+09	1.89E-01	9576.2	9539.7
9	1.25E+04	1.25E+04	2.03E+10	3.48E+09	1.41E+09	4.26E+09	2.70E+08	1.00E+00	6.32E+05	1.57E+10	4.32E+09	8.79E-02	10653.6	10666.3
10	1.50E+04	1.50E+04	9.24E+09	5.78E+08	2.36E+08	8.97E+08	7.88E+06	1.00E+00	2.45E+04	6.56E+09	2.67E+09	4.13E-02	15235.6	15235.2
11	2.07E+04	2.07E+04	3.10E+09	1.74E+08	7.96E+07	3.57E+08	2.75E+06	1.00E+00	3.27E+04	1.94E+09	1.16E+09	1.93E-02	26003.7	26008.1
12	2.30E+04	2.30E+04	8.35E+08	5.43E+07	3.18E+07	1.93E+08	2.70E+06	8.91E+04	7.76E+04	4.31E+08	4.04E+08	1.04E-02	57607.5	57532.5
13	2.20E+04	2.20E+04	1.44E+08	1.55E+07	6.64E+06	1.13E+08	4.70E+06	2.07E+05	1.04E+05	5.22E+07	8.76E+07	2.01E-03	44440.4	44477.9

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.58E+03	1.58E+03	1.10E+07	3.58E+11	7.54E+04	7.26E+11	2.83E+13	7.32E+12	1.83E+10	1.00E+00	1.00E+00	3.51E+00	520.0	520.1
2	2.00E+03	2.00E+03	5.23E+07	9.53E+10	1.14E+06	1.24E+12	8.85E+12	1.74E+12	1.07E+11	1.00E+00	4.68E+00	3.06E+00	1428.0	1432.0
3	3.37E+03	3.37E+03	8.91E+08	1.25E+11	1.44E+08	1.87E+12	2.95E+12	1.00E+00	1.41E+11	1.98E+00	2.25E+01	5.99E+00	5696.3	5644.2
4	4.88E+03	4.88E+03	1.23E+09	4.60E+11	5.91E+08	9.53E+11	8.21E+11	1.00E+00	3.72E+10	3.86E+08	7.24E+06	3.66E+00	8997.9	8979.8
5	1.19E+04	1.19E+04	6.92E+10	5.22E+11	1.72E+11	1.53E+11	1.00E+00	1.00E+00	2.74E+09	3.04E+10	6.12E+07	1.66E+00	11973.3	11968.0
6	1.12E+04	1.12E+04	2.98E+11	3.77E+10	1.33E+10	2.81E+10	1.00E+00	1.00E+00	9.29E+03	2.43E+11	5.26E+10	1.09E+00	9547.8	9384.2
7	1.15E+04	1.15E+04	1.59E+11	3.98E+09	1.10E+09	1.78E+09	1.00E+00	1.00E+00	1.00E+00	1.23E+11	3.63E+10	5.34E-01	11606.0	11631.9
8	1.16E+04	1.16E+04	7.09E+10	7.04E+08	1.95E+08	3.83E+08	1.00E+00	1.00E+00	1.00E+00	5.35E+10	1.74E+10	2.32E-01	11606.0	11637.1
9	1.16E+04	1.16E+04	2.96E+10	1.09E+08	3.01E+07	6.02E+07	1.00E+00	1.00E+00	1.00E+00	2.15E+10	8.15E+09	9.57E-02	11606.0	11623.1
10	1.16E+04	1.16E+04	1.10E+10	1.26E+07	3.48E+06	1.12E+07	1.00E+00	1.00E+00	1.00E+00	7.39E+09	3.56E+09	3.52E-02	11606.0	11613.9
11	1.16E+04	1.16E+04	3.73E+09	1.13E+06	2.78E+05	1.34E+06	1.00E+00	1.00E+00	1.00E+00	2.21E+09	1.52E+09	1.20E-02	11606.0	11621.9
12	2.30E+04	2.30E+04	1.05E+09	1.46E+07	9.88E+06	4.91E+07	1.25E+04	3.00E+02	1.35E+03	4.98E+08	5.47E+08	1.07E-02	57571.6	57453.9
13	2.30E+04	2.30E+04	1.70E+08	1.34E+07	6.38E+06	9.54E+07	2.33E+06	9.34E+04	5.49E+04	6.02E+07	1.06E+08	2.58E-03	56986.4	57021.0

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 3,0

<CYC= 3 TIMDEL= 0. TIMTOT= 6,000000E-03 TTX= 1,002900E+01 DSMALL= 1,041097E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349994E+06	1,731934E-09	-4,795434E+00	2,925230E+23	1,271170E+09	1,100795E+00	6,662281E-05	9,699987E+06	-9,590869E+00
2	1,000006E+07	5,408384E-10	3,983240E+01	2,513004E+23	1,378672E+09	3,728193E-01	0.	1,030012E+07	8,925566E+01
3	1,062510E+07	1,916086E-10	7,906634E+01	2,726880E+23	1,589988E+09	1,523277E-01	2,473686E-05	1,095008E+07	6,867701E+01
4	1,132507E+07	6,473797E-11	5,745333E+01	3,153289E+23	2,091308E+09	6,769350E-02	7,372494E-06	1,170005E+07	4,602964E+01
5	1,210056E+07	2,270094E-11	3,898462E+02	3,375956E+23	3,117173E+09	3,538138E-02	0.	1,250106E+07	7,330628E+02
6	1,295145E+07	9,198555E-12	9,915158E+02	3,806347E+23	4,248293E+09	1,953908E-02	0.	1,340103E+07	1,249369E+03
7	1,405148E+07	3,974555E-12	1,002627E+03	5,506990E+23	5,204352E+09	1,034249E-02	1,656006E-05	1,470113E+07	7,550655E+02
8	1,550106E+07	1,729107E-12	7,115204E+02	6,613674E+23	6,496210E+09	5,616323E-03	1,393873E-06	1,630100E+07	6,671552E+02
9	1,760046E+07	7,184482E-13	3,024603E+02	1,113986E+24	8,183028E+09	2,939541E-03	5,711999E-06	1,889992E+07	-6,223462E+01
10	2,070046E+07	2,667674E-13	2,817678E+02	1,558139E+24	1,251732E+10	1,669606E-03	0.	2,250087E+07	6,257703E+02
11	2,510054E+07	9,155128E-14	3,965047E+02	2,279968E+24	1,854024E+10	8,485061E-04	6,750303E-07	2,770020E+07	1,672391E+02
12	3,120309E+07	2,811169E-14	2,094577E+03	3,129013E+24	3,712020E+10	5,217595E-04	0.	3,470598E+07	4,021916E+03
13	3,970732E+07	7,497585E-15	4,897489E+03	4,581986E+24	5,837047E+10	2,186168E-04	0.	4,470865E+07	5,773061E+03

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 3,0

<CYC= 3 TIMDEL= 0. TIMTOT= 6,000000E-03 TTX= 1,003700E+01 DSMALL= 9,523848E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349966E+06	1,731970E-09	-1,041995E+01	2,925168E+23	1,292500E+09	1,119266E+00	1,448005E-04	9,699972E+06	-2,085969E+01
2	1,000017E+07	5,405994E-10	1,261766E+02	2,514115E+23	1,459322E+09	3,944544E-01	0.	1,030037E+07	2,731931E+02
3	1,062508E+07	1,917708E-10	6,911311E+01	2,724574E+23	1,654383E+09	1,586311E-01	3,811021E-04	1,094978E+07	-1,349606E+02
4	1,132512E+07	6,467703E-11	9,768740E+01	3,156260E+23	2,469428E+09	7,985762E-02	0.	1,170046E+07	3,303416E+02
5	1,210168E+07	2,269064E-11	1,163032E+03	3,381961E+23	3,896562E+09	4,414929E-02	0.	1,250269E+07	1,995722E+03
6	1,295266E+07	9,206994E-12	1,957249E+03	3,802859E+23	4,910328E+09	2,260468E-02	3,518203E-06	1,340263E+07	1,916777E+03
7	1,405238E+07	3,975129E-12	1,604577E+03	5,508195E+23	5,974604E+09	1,187491E-02	2,253847E-05	1,470193E+07	1,290377E+03
8	1,550162E+07	1,729208E-12	1,225334E+03	6,813279E+23	7,459050E+09	6,449124E-03	2,517671E-06	1,630171E+07	1,160241E+03
9	1,759991E+07	7,191470E-13	-7,613196E+01	1,112903E+24	9,374992E+09	3,370999E-03	2,087005E-05	1,889812E+07	-1,312555E+03
10	2,070014E+07	2,665380E-13	1,367366E+02	1,559481E+24	2,038142E+10	2,716211E-03	0.	2,250217E+07	1,590024E+03
11	2,510294E+07	9,149154E-14	2,081211E+03	2,280958E+24	3,569778E+10	1,633022E-03	0.	2,770372E+07	2,570394E+03
12	3,121098E+07	2,807617E-14	7,413202E+03	3,132994E+24	7,293837E+10	1,023915E-03	0.	3,471825E+07	1,225001E+04
13	3,971736E+07	7,500682E-15	1,162768E+04	4,580094E+24	9,282531E+10	3,481266E-04	2,370688E-07	4,471648E+07	1,100554E+04

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 3,0

<CYC= 3 TIMDEL= 0. TIMTOT= 6,000000E-03 TTX= 1,004500E+01 DSMALL= 8,000894E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,350028E+06	1,731763E-09	1,965872E+01	2,925519E+23	1,354501E+09	1,172837E+00	0.	9,700056E+06	3,931744E+01
2	1,000025E+07	5,406123E-10	1,874787E+02	2,514055E+23	1,594933E+09	4,311203E-01	0.	1,030044E+07	3,356400E+02
3	1,062499E+07	1,918640E-10	2,103446E+01	2,723250E+23	1,949524E+09	1,889404E-01	6,402083E-04	1,094954E+07	-2,935711E+02
4	1,132604E+07	6,497711E-11	7,420860E+02	3,166046E+23	3,532663E+09	1,138880E-01	0.	1,170254E+07	1,777743E+03
5	1,210452E+07	2,261740E-11	3,120174E+03	3,380426E+23	5,426010E+09	6,130111E-02	0.	1,250650E+07	4,462604E+03
6	1,295550E+07	9,226749E-12	3,735705E+03	3,794718E+23	6,245495E+09	2,881281E-02	1,214043E-04	1,340450E+07	3,008004E+03
7	1,405368E+07	3,977390E-12	2,402092E+03	5,505064E+23	7,882064E+09	1,567490E-02	4,831729E-05	1,470286E+07	1,795373E+03
8	1,550331E+07	1,728000E-12	2,260409E+03	6,816042E+23	1,132767E+10	9,787109E-03	0.	1,630375E+07	2,725405E+03
9	1,759461E+07	7,221270E-13	-2,184952E+03	1,108311E+24	1,464000E+10	5,285970E-03	1,081365E-04	1,868947E+07	-7,095344E+03
10	2,069922E+07	2,654008E-13	-3,222481E+02	1,566163E+24	5,503248E+10	7,302832E-03	0.	2,250897E+07	6,450768E+03
11	2,511990E+07	9,113105E-14	1,365342E+04	2,289981E+24	1,086552E+11	4,960042E-03	0.	2,773083E+07	2,085687E+04
12	3,124111E+07	2,804954E-14	2,763913E+04	3,135969E+24	1,534668E+11	2,292563E-03	0.	3,475139E+07	3,442143E+04
13	3,974206E+07	7,512827E-15	2,814243E+04	4,572690E+24	1,642243E+11	6,166942E-04	4,405801E-06	4,473273E+07	2,186346E+04

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 3,0

KCYC= 5 TIMDEL= 0, TIMTOT= 6,000000E-03 TTX= 1,005300E+01 DSMALL= 5,314574E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,350302E+06	1,730405E-09	2,194856E+02	2,927814E+23	1,587541E+09	1,373545E+00	0,	9,700605E+06	4,589712E+02
2	1,000001E+07	5,420324E-10	5,027395E+01	2,507468E+23	1,915649E+09	5,191721E-01	2,302663E-03	1,029942E+07	-3,384233E+02
3	1,062487E+07	1,913337E-10	-4,490377E+01	2,730798E+23	3,391810E+09	3,244838E-01	0,	1,095051E+07	2,406154E+02
4	1,135130E+07	6,371642E-11	4,419840E+03	3,203844E+23	7,192847E+09	2,291513E-01	0,	1,171229E+07	6,591064E+03
5	1,211225E+07	2,273102E-11	8,417554E+03	3,371488E+23	8,840532E+09	1,004772E-01	2,734629E-05	1,251221E+07	8,240444E+03
6	1,296059E+07	9,231457E-12	7,336815E+03	3,792781E+23	1,107022E+10	5,109713E-02	1,993548E-04	1,340974E+07	6,429566E+03
7	1,405210E+07	4,019660E-12	9,771803E+02	5,447174E+23	1,532283E+10	3,079627E-02	6,629917E-04	1,469146E+07	-4,475225E+03
8	1,549919E+07	1,718812E-12	-2,634687E+02	6,054488E+23	3,943226E+10	3,388832E-02	0,	1,630392E+07	3,940268E+03
9	1,759567E+07	7,227530E-13	-1,678183E+03	1,107351E+24	7,637264E+10	2,759928E-02	2,769797E-04	1,888741E+07	-7,304654E+03
10	2,072954E+07	2,607121E-13	2,067206E+04	1,594329E+24	2,140855E+11	2,790734E-02	0,	2,257107E+07	4,664877E+04
11	2,520194E+07	9,043856E-14	6,860061E+04	2,307516E+24	3,522730E+11	1,592953E-02	0,	2,783221E+07	8,655244E+04
12	3,134333E+07	2,803416E-14	9,586140E+04	3,137689E+24	4,193824E+11	5,878518E-03	0,	3,485446E+07	1,051704E+05
13	3,980859E+07	7,566762E-15	7,255682E+04	4,540096E+24	2,960703E+11	1,120147E-03	3,188704E-05	4,476272E+07	4,194330E+04

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 3,0

KCYC= 3 TIMDEL= 0, TIMTOT= 6,000000E-03 TTX= 1,006100E+01 DSMALL= 2,132427E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,350873E+06	1,727587E-09	6,679506E+02	2,932590E+23	2,471074E+09	2,134497E+00	0,	9,701747E+06	1,355901E+03
2	9,997374E+06	5,489683E-10	-1,743534E+03	2,475788E+23	5,710361E+09	1,018435E+00	2,563137E-02	1,029300E+07	-4,822970E+03
3	1,063063E+07	1,844263E-10	4,087858E+03	2,633076E+23	1,203163E+10	1,109474E+00	0,	1,096826E+07	1,299869E+04
4	1,135479E+07	6,279842E-11	2,087494E+04	3,250653E+23	2,066635E+10	6,489121E-01	0,	1,174151E+07	2,875120E+04
5	1,213367E+07	2,317033E-11	2,251244E+04	3,307566E+23	2,696924E+10	3,124431E-01	5,140728E-03	1,252602E+07	1,027367E+04
6	1,293693E+07	1,008252E-11	-8,214463E+03	3,472632E+23	5,005106E+10	2,523205E-01	1,576701E-02	1,334745E+07	-3,270260E+04
7	1,406996E+07	3,575537E-12	1,640617E+04	6,123775E+23	1,393436E+11	2,491141E-01	0,	1,479206E+07	6,551491E+04
8	1,564110E+07	1,628329E-12	9,635440E+04	7,235378E+23	2,145713E+11	1,746964E-01	0,	1,649022E+07	1,271959E+05
9	1,776419E+07	7,324596E-13	1,106430E+05	1,092676E+24	2,464577E+11	9,026015E-02	1,538477E-03	1,903816E+07	9,409223E+04
10	2,083549E+07	2,671242E-13	9,143842E+04	1,556058E+24	3,099814E+11	4,140177E-02	5,460771E-05	2,263262E+07	8,070461E+04
11	2,522401E+07	9,179653E-14	8,294647E+04	2,273340E+24	4,230487E+11	1,941720E-02	7,667109E-05	2,781519E+07	7,710833E+04
12	3,139460E+07	2,749518E-14	1,298150E+05	3,199196E+24	7,320889E+11	1,006446E-02	0,	3,497401E+07	1,025216E+05
13	3,949591E+07	7,614341E-15	1,306643E+05	4,511727E+24	5,386897E+11	2,050884E-03	7,461064E-05	4,481781E+07	7,880690E+04

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 3,0

KCYC= 5 TIMDEL= 1,000000E-03 TIMTOT= 7,000000E-03 TTX= 1,007000E+01 DSMALL= 1,025594E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,348849E+06	1,737624E-09	-8,205824E+02	2,915651E+23	4,054491E+09	3,522590E+00	3,422295E-02	9,697698E+06	-1,641165E+03
2	9,976787E+06	5,815345E-10	-1,650773E+04	2,337142E+23	1,162900E+10	3,381332E+00	4,516614E-01	1,025568E+07	-5,137430E+04
3	1,064855E+07	1,585640E-10	1,616295E+04	3,295160E+23	5,812682E+10	4,608410E+00	0,	1,104123E+07	6,370021E+04
4	1,145710E+07	5,834930E-11	9,967523E+04	3,496542E+23	1,083094E+11	3,159893E+00	0,	1,187297E+07	1,556503E+05
5	1,226268E+07	2,335414E-11	1,286992E+05	3,281533E+23	1,484226E+11	1,733141E+00	2,350274E-02	1,265119E+07	1,217462E+05
6	1,320995E+07	7,404584E-12	1,745591E+05	4,725990E+23	2,217384E+11	8,213836E-01	0,	1,376470E+07	2,273649E+05
7	1,440340E+07	4,063805E-12	2,249168E+05	5,388001E+23	2,699633E+11	5,485391E-01	4,153934E-05	1,503404E+07	2,264637E+05
8	1,579969E+07	1,814498E-12	2,016036E+05	6,493022E+23	2,727726E+11	2,474727E-01	9,437883E-03	1,656128E+07	1,767435E+05
9	1,782513E+07	7,381837E-13	1,520254E+05	1,084203E+24	2,688961E+11	9,924737E-02	3,767060E-03	1,908899E+07	1,273073E+05
10	2,086531E+07	2,702585E-13	1,109089E+05	1,538012E+24	2,650696E+11	3,581866E-02	8,643202E-04	2,264164E+07	9,451051E+04
11	2,517790E+07	9,379760E-14	5,282933E+04	2,224880E+24	2,636690E+11	1,236576E-02	8,743993E-04	2,771416E+07	1,114814E+04
12	3,133958E+07	2,715066E-14	9,312785E+04	3,239792E+24	7,497091E+11	1,017755E-02	0,	3,496500E+07	1,751076E+05
13	3,990888E+07	7,580336E-15	1,387323E+05	4,531966E+24	6,898471E+11	2,614636E-03	8,723791E-05	4,485259E+07	1,023571E+05

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1   TDAT1 = 1.00   TDAT2 = 3.00

K	TEL	TVIBN2	FNF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4.66E+02	4.66E+02	1.29E+06	2.33E+09	1.00E+00	3.41E+11	2.84E+13	7.52E+12	1.80E+09	1.00E+00	1.00E+00	1.10E+00	219.6	219.6
2	5.69E+02	5.69E+02	1.37E+06	2.61E+09	1.00E+00	4.51E+11	8.88E+12	2.18E+12	1.94E+09	1.00E+00	1.90E+00	3.77E-01	234.6	234.5
3	6.07E+02	6.07E+02	1.71E+06	1.38E+09	1.00E+00	3.42E+11	3.15E+12	6.80E+11	1.17E+09	1.00E+00	1.54E+01	1.55E-01	264.6	264.6
4	6.35E+02	6.35E+02	1.27E+06	6.17E+08	1.63E+07	1.61E+11	1.06E+12	2.07E+11	5.50E+08	1.00E+00	9.09E+01	6.88E-02	342.4	342.4
5	7.40E+02	7.40E+02	4.09E+06	4.74E+08	9.22E+07	6.37E+10	3.72E+11	6.91E+10	3.28E+08	1.00E+00	6.48E+05	3.62E-02	506.8	506.6
6	7.95E+02	7.95E+02	1.27E+07	2.73E+08	1.20E+08	3.35E+10	1.50E+11	2.52E+10	1.29E+08	1.00E+00	9.85E+06	1.99E-02	678.0	677.8
7	6.90E+02	6.90E+02	8.57E+06	7.05E+07	4.20E+07	1.84E+10	6.37E+10	9.78E+09	3.45E+07	1.00E+00	7.52E+06	1.04E-02	813.9	814.1
8	7.73E+02	7.73E+02	1.01E+07	4.77E+07	3.17E+07	1.01E+10	2.70E+10	3.77E+09	2.06E+07	2.50E+03	9.50E+06	5.64E-03	990.9	991.0
9	9.15E+02	9.15E+02	1.10E+07	3.04E+07	2.03E+07	5.49E+09	1.07E+10	1.34E+09	1.28E+07	6.17E+05	9.13E+06	2.96E-03	1205.5	1205.7
10	1.66E+03	1.66E+03	3.67E+07	4.94E+07	2.95E+07	2.78E+09	3.64E+09	3.82E+08	7.22E+06	1.62E+07	1.63E+07	1.73E-03	1735.1	1734.9
11	2.45E+03	2.45E+03	4.00E+07	3.30E+07	1.35E+07	1.31E+09	1.06E+09	9.43E+07	3.31E+06	2.55E+07	1.31E+07	8.69E-04	2359.3	2359.4
12	4.66E+03	4.66E+03	4.08E+07	2.15E+07	7.91E+06	5.47E+08	2.34E+08	1.71E+07	1.15E+06	2.45E+07	1.56E+07	5.26E-04	4101.4	4099.9
13	6.51E+03	6.51E+03	1.83E+07	5.26E+06	1.59E+06	1.89E+08	3.60E+07	2.12E+06	2.78E+05	7.15E+06	9.91E+06	2.20E-04	5711.5	5710.6

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2   TDAT1 = 1.00   TDAT2 = 3.00

K	TEL	TVIBN2	FNF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5.27E+02	5.27E+02	1.45E+06	5.08E+09	1.00E+00	3.45E+11	2.84E+13	7.52E+12	2.93E+09	1.00E+00	1.00E+00	1.13E+00	223.2	223.2
2	6.63E+02	6.63E+02	1.82E+06	5.68E+09	1.00E+00	4.56E+11	8.87E+12	2.17E+12	3.03E+09	1.00E+00	1.97E+00	4.03E-01	248.3	248.2
3	6.37E+02	6.37E+02	1.80E+06	1.78E+09	1.00E+00	3.44E+11	3.15E+12	6.79E+11	1.42E+09	1.00E+00	1.57E+01	1.62E-01	275.1	275.2
4	7.42E+02	7.42E+02	2.43E+06	1.31E+09	1.88E+07	1.65E+11	1.06E+12	2.04E+11	1.02E+09	1.00E+00	1.50E+02	8.21E-02	403.8	403.7
5	8.92E+02	8.92E+02	6.52E+06	1.04E+09	1.48E+08	6.63E+10	3.71E+11	6.74E+10	6.27E+08	1.00E+00	1.70E+06	4.56E-02	631.9	631.1
6	8.43E+02	8.43E+02	1.62E+07	3.66E+08	1.47E+08	3.46E+10	1.50E+11	2.46E+10	1.66E+08	1.00E+00	1.32E+07	2.30E-02	781.1	781.1
7	8.17E+02	8.17E+02	1.72E+07	1.37E+08	8.26E+07	1.88E+10	6.37E+10	9.53E+09	4.90E+07	1.52E+00	1.60E+07	1.20E-02	931.2	931.5
8	9.64E+02	9.64E+02	2.07E+07	8.87E+07	6.47E+07	1.04E+10	2.70E+10	3.65E+09	2.46E+07	2.22E+04	1.97E+07	6.50E-03	1133.2	1133.3
9	1.17E+03	1.17E+03	2.31E+07	6.39E+07	4.65E+07	5.58E+09	1.07E+10	1.29E+09	1.39E+07	1.35E+06	1.96E+07	3.41E-03	1373.6	1374.5
10	2.87E+03	2.87E+03	1.11E+08	1.43E+08	7.52E+07	2.90E+09	3.53E+09	3.19E+08	7.58E+06	6.29E+07	3.76E+07	2.91E-03	2732.3	2730.9
11	4.47E+03	4.47E+03	1.19E+08	9.32E+07	3.37E+07	1.33E+09	9.91E+08	7.55E+07	3.12E+06	8.38E+07	3.27E+07	1.69E-03	4263.3	4262.6
12	7.38E+03	7.38E+03	9.21E+07	4.51E+07	1.81E+07	5.34E+08	2.01E+08	1.34E+07	1.44E+06	5.61E+07	3.55E+07	1.03E-03	7421.1	7414.2
13	8.45E+03	8.45E+03	3.09E+07	8.51E+06	3.16E+06	1.82E+08	3.09E+07	1.70E+06	2.93E+05	1.23E+07	1.71E+07	3.50E-04	8655.0	8655.5

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3   TDAT1 = 1.00   TDAT2 = 3.00

K	TEL	TVIBN2	FNF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6.32E+02	6.32E+02	1.73E+06	1.36E+10	4.36E+05	3.55E+11	2.84E+13	7.51E+12	3.64E+09	1.00E+00	1.00E+00	1.19E+00	233.9	233.9
2	7.68E+02	7.68E+02	2.10E+06	1.10E+10	1.00E+00	4.62E+11	8.87E+12	2.17E+12	3.59E+09	1.00E+00	2.05E+00	4.45E-01	271.2	271.1
3	7.55E+02	7.55E+02	2.15E+06	3.90E+09	1.00E+00	3.53E+11	3.15E+12	6.75E+11	2.42E+09	1.00E+00	1.73E+01	1.95E-01	327.0	327.2
4	9.38E+02	9.38E+02	3.33E+06	3.29E+09	4.17E+06	1.75E+11	1.06E+12	1.98E+11	1.97E+09	1.00E+00	6.50E+02	1.19E-01	575.9	574.9
5	1.05E+03	1.05E+03	1.00E+07	1.87E+09	1.74E+08	7.20E+10	3.70E+11	6.42E+10	1.05E+09	1.00E+00	3.65E+06	6.42E-02	875.0	873.1
6	8.99E+02	8.99E+02	2.15E+07	4.83E+08	1.75E+08	3.70E+10	1.50E+11	2.35E+10	2.21E+08	1.00E+00	1.84E+07	2.94E-02	986.8	987.6
7	1.08E+03	1.08E+03	3.94E+07	3.24E+08	1.83E+08	2.00E+10	6.35E+10	8.96E+09	8.98E+07	7.16E+00	3.77E+07	1.59E-02	1218.5	1219.2
8	1.52E+03	1.52E+03	5.80E+07	2.33E+08	1.75E+08	1.13E+10	2.68E+10	3.21E+09	3.77E+07	5.25E+05	5.11E+07	1.01E-02	1695.8	1695.3
9	2.06E+03	2.06E+03	8.45E+07	2.26E+08	1.47E+08	5.97E+09	1.06E+10	1.11E+09	1.92E+07	1.43E+07	5.60E+07	5.58E-03	2094.6	2099.8
10	6.53E+03	6.55E+03	4.37E+08	5.86E+08	1.49E+08	3.23E+09	3.10E+09	1.44E+08	1.18E+07	3.41E+08	9.03E+07	7.87E-03	6588.0	6572.0
11	1.04E+04	1.04E+04	4.04E+08	3.33E+08	1.00E+08	1.32E+09	7.18E+08	3.51E+07	1.91E+07	2.97E+08	1.03E+08	5.06E-03	10947.4	10927.2
12	1.31E+04	1.31E+04	2.01E+08	8.75E+07	3.65E+07	4.98E+08	1.36E+08	7.62E+06	4.16E+06	1.21E+08	7.89E+07	2.30E-03	14543.4	14553.6
13	1.18E+04	1.18E+04	5.34E+07	1.33E+07	5.71E+06	1.70E+08	2.27E+07	1.23E+06	3.89E+05	2.12E+07	3.05E+07	6.20E-04	14394.9	14406.0

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	8,33E+02	8,33E+02	2,24E+06	4,98E+10	1,22E+07	3,85E+11	2,84E+13	7,49E+12	1,25E+09	1,00E+00	1,00E+00	1,40E+00	274,0	273,9
2	9,20E+02	9,20E+02	2,50E+06	2,23E+10	2,08E+07	4,82E+11	8,89E+12	2,17E+12	2,97E+09	1,00E+00	2,21E+00	5,40E-01	324,9	325,2
3	1,05E+03	1,05E+03	3,01E+06	1,22E+10	5,32E+05	3,94E+11	3,13E+12	6,51E+11	3,73E+09	1,00E+00	2,17E+01	3,40E-01	560,5	560,1
4	1,39E+03	1,39E+03	7,33E+06	6,69E+09	3,78E+00	2,11E+11	1,04E+12	1,75E+11	5,60E+09	1,00E+00	2,76E+03	2,45E-01	1161,9	1153,7
5	1,14E+03	1,14E+03	1,49E+07	2,10E+09	1,45E+08	8,66E+10	3,71E+11	5,70E+10	1,76E+09	1,00E+00	7,58E+06	1,05E-01	1402,6	1402,7
6	1,37E+03	1,37E+03	5,74E+07	1,50E+09	3,75E+08	4,38E+10	1,49E+11	1,99E+10	7,28E+08	2,57E+00	5,20E+07	5,31E-02	1716,1	1718,2
7	2,05E+03	2,05E+03	1,07E+08	1,50E+09	5,21E+08	2,38E+10	6,32E+10	7,14E+09	3,48E+08	3,80E+02	1,02E+08	3,19E-02	2292,9	2305,2
8	5,35E+03	5,35E+03	2,25E+08	3,04E+09	6,29E+08	1,59E+10	2,46E+10	9,41E+08	2,60E+08	9,21E+07	1,01E+08	3,73E-02	5381,0	5365,7
9	8,67E+03	8,67E+03	1,16E+09	4,03E+09	6,89E+08	7,37E+09	7,90E+09	2,46E+08	2,64E+08	9,90E+08	1,32E+08	2,90E-02	8910,4	8935,8
10	1,44E+04	1,44E+04	2,59E+09	2,25E+09	1,15E+09	2,96E+09	8,75E+08	1,00E+00	4,73E+07	2,12E+09	4,53E+08	2,87E-02	16793,0	16620,0
11	2,16E+04	2,16E+04	1,48E+09	4,50E+08	3,56E+08	1,06E+09	1,60E+08	1,00E+00	1,13E+07	1,05E+09	4,30E+08	1,61E-02	23605,3	23481,1
12	2,30E+04	2,30E+04	4,47E+08	1,02E+08	6,75E+07	3,99E+08	4,64E+07	1,69E+06	3,72E+06	2,55E+08	1,89E+08	5,89E-03	30390,9	30342,3
13	1,73E+04	1,73E+04	9,20E+07	1,70E+07	8,27E+06	1,49E+08	1,28E+07	6,33E+05	3,97E+05	3,58E+07	5,49E+07	1,12E-03	23887,8	23982,5

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,19E+03	1,19E+03	3,15E+06	1,69E+11	2,31E+06	5,07E+11	2,83E+13	7,42E+12	7,90E+08	1,00E+00	1,00E+00	2,19E+00	425,3	424,8
2	1,28E+03	1,28E+03	3,48E+06	4,99E+10	2,04E+07	6,33E+11	8,99E+12	2,12E+12	4,12E+09	1,00E+00	3,15E+00	1,08E+00	621,1	625,3
3	1,91E+03	1,91E+03	1,57E+07	1,02E+00	1,00E+00	6,56E+11	3,01E+12	4,68E+11	4,80E+10	1,00E+00	3,26E+01	1,17E+00	1958,8	1925,2
4	2,09E+03	2,09E+03	3,36E+07	1,05E+00	1,00E+00	3,45E+11	1,02E+12	9,37E+10	2,65E+10	1,00E+00	1,16E+03	6,82E-01	3214,9	3171,3
5	2,37E+03	2,37E+03	3,72E+07	1,85E+09	1,79E+07	1,49E+11	3,74E+11	2,33E+10	1,04E+10	2,95E+00	3,57E+06	3,34E-01	4012,2	4048,4
6	5,64E+03	5,64E+03	6,65E+07	1,16E+10	7,62E+08	9,38E+10	1,54E+11	1,00E+00	5,14E+09	2,47E+01	2,90E+05	2,74E-01	6690,9	6960,0
7	9,54E+03	9,54E+03	8,43E+09	8,26E+10	2,41E+10	2,59E+10	2,36E+09	1,00E+00	4,94E+08	7,99E+09	1,71E+08	2,67E-01	13017,3	12408,0
8	1,24E+04	1,24E+04	3,87E+10	1,41E+10	4,15E+09	1,02E+10	5,51E+07	1,00E+00	2,12E+06	3,21E+10	6,14E+09	1,77E-01	12348,2	12024,9
9	1,30E+04	1,30E+04	2,00E+10	4,62E+09	1,50E+09	4,67E+09	1,00E+00	1,00E+00	6,51E+04	1,56E+10	4,25E+09	9,11E-02	12882,5	12994,4
10	1,48E+04	,48E+04	9,21E+09	5,90E+08	2,70E+08	9,02E+08	2,45E+06	1,00E+00	1,55E+04	6,54E+09	2,67E+09	4,14E-02	14707,3	14715,5
11	2,04E+04	2,04E+04	3,11E+09	1,49E+08	1,10E+08	3,59E+08	1,89E+06	1,00E+00	2,13E+04	1,95E+09	1,16E+09	1,94E-02	20400,5	20427,9
12	2,30E+04	2,30E+04	8,18E+08	4,81E+07	3,73E+07	1,89E+08	2,26E+06	3,87E+04	1,23E+05	4,22E+08	3,96E+08	1,01E-02	50113,7	49602,2
13	2,30E+04	2,30E+04	1,42E+08	1,62E+07	9,62E+06	1,18E+08	4,57E+06	1,94E+05	2,00E+05	5,28E+07	8,87E+07	2,05E-03	40088,2	40359,1

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,58E+03	1,58E+03	4,13E+06	1,66E+10	3,99E+06	1,07E+12	2,85E+13	7,17E+12	2,19E+10	1,00E+00	1,00E+00	4,15E+00	692,2	693,2
2	2,00E+03	2,00E+03	7,69E+06	6,15E+05	2,61E+07	1,43E+12	9,49E+12	1,79E+12	1,42E+11	1,00E+00	6,45E+00	3,55E+00	1840,5	1903,2
3	3,37E+03	3,37E+03	4,86E+08	2,97E+11	1,66E+08	1,39E+12	2,29E+12	1,00E+00	3,32E+11	1,00E+00	4,35E+01	4,11E+00	8532,5	7817,7
4	4,86E+03	4,86E+03	1,50E+09	4,36E+11	9,10E+08	8,44E+11	7,25E+11	1,00E+00	5,37E+10	1,55E+00	1,23E+02	3,11E+00	11719,7	11141,0
5	1,29E+04	1,29E+04	2,78E+10	5,63E+11	1,99E+11	1,94E+11	1,57E+09	1,00E+00	1,38E+00	2,16E+10	4,26E+09	1,76E+00	12197,5	12369,0
6	1,07E+04	1,07E+04	2,12E+11	6,33E+10	1,63E+10	2,49E+10	1,30E-02	1,00E+00	1,00E+00	1,67E+11	4,44E+10	8,30E-01	12004,6	10930,6
7	1,17E+04	1,17E+04	1,50E+11	1,17E+10	3,19E+09	4,65E+09	1,00E+00	1,00E+00	1,00E+00	1,16E+11	3,42E+10	5,49E-01	12226,6	12338,8
8	1,18E+04	1,18E+04	7,15E+10	2,20E+09	6,08E+08	1,13E+09	1,00E+00	1,00E+00	1,00E+00	5,40E+10	1,75E+10	2,48E-01	11887,4	12145,1
9	1,17E+04	1,17E+04	2,99E+10	3,35E+08	9,29E+07	1,81E+08	1,00E+00	1,00E+00	1,00E+00	2,17E+10	8,24E+09	9,92E-02	11706,3	11651,1
10	1,17E+04	1,17E+04	1,10E+10	3,82E+07	1,06E+07	3,36E+07	1,00E+00	1,00E+00	1,00E+00	7,44E+09	3,58E+09	3,58E-02	11630,7	11697,2
11	1,17E+04	1,17E+04	3,80E+09	3,41E+06	9,42E+05	4,10E+06	1,00E+00	1,00E+00	1,00E+00	2,25E+09	1,55E+09	1,24E-02	11617,9	11746,2
12	2,30E+04	2,30E+04	1,01E+09	1,32E+07	1,07E+07	4,76E+07	1,03E+04	1,16E+02	7,05E+02	4,82E+08	5,30E+08	1,02E-02	47619,3	46874,2
13	2,30E+04	2,30E+04	1,69E+08	1,38E+07	8,85E+06	9,88E+07	2,24E+06	8,59E+04	1,02E+05	6,07E+07	1,07E+08	2,62E-03	51398,5	51643,3

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 10,0

KCYC= 5 TIMDEL= 1,000000E-03 TIMTOT= 1,400000E-02 TTX= 1,038900E+01 DSMALL= 9,957113E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349916E+06	1,732319E-09	-1,679787E+01	2,924580E+23	1,277033E+09	1,106114E+00	3,097938E-04	9,699832E+06	-3,359573E+01
2	1,000080E+07	5,392139E-10	1,750735E+02	2,520575E+23	1,396559E+09	3,765219E-01	0,	1,030178E+07	3,837427E+02
3	1,062673E+07	1,916219E-10	3,882364E+02	2,726690E+23	1,618199E+09	1,550412E-01	4,542003E-08	1,095108E+07	3,927301E+02
4	1,132645E+07	6,477560E-11	3,417475E+02	3,151457E+23	2,130700E+09	6,900870E-02	4,327414E-05	1,170121E+07	2,907650E+02
5	1,210722E+07	2,239325E-11	1,508092E+03	3,422343E+23	3,190873E+09	3,572701E-02	0,	1,251322E+07	2,725420E+03
6	1,296767E+07	9,115801E-12	3,644605E+03	3,840902E+23	4,350766E+09	1,985770E-02	0,	1,342212E+07	4,563790E+03
7	1,400761E+07	3,999916E-12	3,633089E+03	5,474061E+23	5,270879E+09	1,054154E-02	7,950824E-05	1,471311E+07	2,702387E+03
8	1,551209E+07	1,731124E-12	2,456165E+03	6,805736E+23	6,545968E+09	5,665943E-03	9,023459E-06	1,631106E+07	2,209944E+03
9	1,760460E+07	7,217314E-13	8,648915E+02	1,108918E+24	8,290068E+09	2,991608E-03	2,595545E-05	1,889813E+07	-4,801606E+02
10	2,070530E+07	2,657763E-13	1,130675E+03	1,563950E+24	1,333361E+10	1,771879E-03	0,	2,251246E+07	2,741511E+03
11	2,510863E+07	9,165208E-14	2,001914E+03	2,276963E+24	1,953345E+10	8,951407E-04	2,817741E-06	2,770461E+07	1,262317E+03
12	3,123659E+07	2,787914E-14	7,550825E+03	3,155136E+24	3,777491E+10	5,265601E-04	0,	3,476837E+07	1,383935E+04
13	3,978252E+07	7,476748E-15	1,661553E+04	4,594755E+24	5,878482E+10	2,197596E-04	0,	4,479608E+07	1,939173E+04

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 10,0

KCYC= 5 TIMDEL= 0, TIMTOT= 1,400000E-02 TTX= 1,039600E+01 DSMALL= 8,365992E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,349823E+06	1,732778E-09	-3,429735E+01	2,923805E+23	1,305232E+09	1,130838E+00	6,511689E-04	9,699647E+06	-6,659470E+01
2	1,000248E+07	5,354868E-10	5,346647E+02	2,536214E+23	1,495532E+09	4,007194E-01	0,	1,030532E+07	1,137924E+03
3	1,062666E+07	1,936575E-10	4,565931E+02	2,698030E+23	1,699077E+09	1,645195E-01	1,660526E-03	1,094840E+07	-2,247301E+02
4	1,132735E+07	6,405982E-11	5,589929E+02	3,186670E+23	2,537736E+09	8,128344E-02	0,	1,170630E+07	1,342724E+03
5	1,212097E+07	2,192445E-11	4,320841E+03	3,495520E+23	4,026996E+09	4,414484E-02	0,	1,253563E+07	7,296959E+03
6	1,298467E+07	9,225083E-12	7,126009E+03	3,795402E+23	5,083188E+09	2,344641E-02	3,701178E-05	1,343372E+07	6,953059E+03
7	1,407798E+07	4,007421E-12	5,762517E+03	5,463810E+23	6,102986E+09	1,222862E-02	1,094265E-04	1,472225E+07	4,571974E+03
8	1,552078E+07	1,732051E-12	4,210327E+03	6,802096E+23	7,573366E+09	6,558726E-03	1,382771E-05	1,631931E+07	3,846660E+03
9	1,759700E+07	7,306446E-13	-7,862669E+02	1,095390E+24	9,636886E+09	3,520570E-03	1,032970E-04	1,687488E+07	-5,421214E+03
10	2,070426E+07	2,625485E-13	1,103432E+03	1,583177E+24	2,299621E+10	3,018810E-03	0,	2,253365E+07	7,620078E+03
11	2,514135E+07	9,123783E-14	9,168126E+03	2,287301E+24	3,833911E+10	1,748988E-03	0,	2,774906E+07	1,070817E+04
12	3,132753E+07	2,750786E-14	2,604312E+04	3,197722E+24	7,361069E+10	1,012436E-03	0,	3,490601E+07	4,137806E+04
13	3,984524E+07	7,511595E-15	3,920585E+04	4,573440E+24	9,366718E+10	3,517949E-04	1,087245E-06	4,488448E+07	3,703364E+04

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 10,0

KCYC= 5 TIMDEL= 0, TIMTOT= 1,400000E-02 TTX= 1,040400E+01 DSMALL= 6,783594E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,350395E+06	1,729946E-09	8,753635E+01	2,928591E+23	1,380696E+09	1,194265E+00	0,	9,700791E+06	1,750727E+02
2	1,000379E+07	5,356056E-10	8,247772E+02	2,537556E+23	1,660437E+09	4,446697E-01	0,	1,030678E+07	1,474482E+03
3	1,062660E+07	1,946986E-10	4,879240E+02	2,683603E+23	2,065282E+09	2,010538E-01	2,743090E-03	1,094642E+07	-4,980338E+02
4	1,133916E+07	6,180941E-11	3,042269E+03	3,302693E+23	3,651686E+09	1,128543E-01	0,	1,173189E+07	6,585171E+03
5	1,215497E+07	2,148613E-11	1,118925E+04	3,566830E+23	5,624887E+09	6,042852E-02	0,	1,257805E+07	1,579534E+04
6	1,301529E+07	9,473187E-12	1,332281E+04	3,696000E+23	6,553616E+09	3,104182E-02	5,984606E-04	1,345253E+07	1,085028E+04
7	1,409106E+07	4,043285E-12	8,424701E+03	5,415345E+23	8,208734E+09	1,659513E-02	2,646473E-04	1,472959E+07	5,999117E+03
8	1,555740E+07	1,712057E-12	7,423351E+03	6,881534E+23	1,178639E+10	1,008948E-02	0,	1,634521E+07	8,647584E+03
9	1,756306E+07	7,666857E-13	-7,361941E+03	1,043897E+24	1,633292E+10	6,261107E-03	5,736603E-04	1,878090E+07	-2,357147E+04
10	2,070519E+07	2,495994E-13	2,395396E+03	1,665312E+24	6,040313E+10	7,538294E-03	0,	2,262947E+07	2,036226E+04
11	2,553428E+07	8,761724E-14	5,045122E+04	2,381819E+24	1,113374E+11	4,877538E-03	0,	2,805709E+07	7,254018E+04
12	3,166509E+07	2,725522E-14	9,342006E+04	3,227362E+24	1,629769E+11	2,220986E-03	0,	3,527308E+07	1,142949E+05
13	4,017087E+07	7,645622E-15	9,434968E+04	4,493268E+24	1,666982E+11	6,372556E-04	1,859750E-05	4,506866E+07	7,439943E+04

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 10.0

<CYC= 6 TIMDEL= 1,000000E-03 TIMTOT= 1,500000E-02 TTX= 1,041300E+01 DSMALL= 3,436781E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,353787E+06	1,713342E-09	7,523544E+02	2,956971E+23	1,615292E+09	1,383774E+00	0,	9,707574E+06	1,504709E+03
2	1,000191E+07	5,513694E-10	5,157298E+02	2,465006E+23	2,036129E+09	5,613297E-01	9,439498E-03	1,029625E+07	-4,732492E+02
3	1,062867E+07	1,884507E-10	8,087566E+02	2,772575E+23	3,596847E+09	3,389141E-01	0,	1,095709E+07	2,090762E+03
4	1,140323E+07	5,439955E-11	1,583398E+04	3,752558E+23	7,312215E+09	1,988906E-01	0,	1,184937E+07	2,957719E+04
5	1,224561E+07	2,293512E-11	2,915355E+04	3,341485E+23	9,404540E+09	1,078471E-01	3,849589E-04	1,264165E+07	2,672990E+04
6	1,307339E+07	9,596719E-12	2,441231E+04	3,648424E+23	1,206935E+10	5,791307E-02	1,745983E-03	1,350492E+07	2,004472E+04
7	1,406285E+07	4,627767E-12	3,167313E+03	4,731393E+23	1,769874E+10	4,095283E-02	5,023324E-03	1,462078E+07	-1,370009E+04
8	1,550080E+07	1,571762E-12	4,831056E+02	7,495778E+23	4,316313E+10	3,392108E-02	0,	1,638082E+07	1,472630E+04
9	1,761800E+07	7,545729E-13	1,048977E+04	1,060654E+24	8,860067E+10	3,342783E-02	4,204759E-04	1,885519E+07	6,253257E+03
10	2,100078E+07	2,155624E-13	8,151969E+04	1,428263E+24	2,037870E+11	2,196440E-02	0,	2,330636E+07	1,567861E+05
11	2,623250E+07	8,104148E-14	2,214521E+05	2,575081E+24	3,379074E+11	1,369226E-02	0,	2,915605E+07	2,601181E+05
12	3,278005E+07	2,706399E-14	3,110046E+05	3,250167E+24	4,135037E+11	5,595530E-03	0,	3,640146E+07	3,356910E+05
13	4,091299E+07	8,282076E-15	2,430265E+05	4,147973E+24	3,111480E+11	1,288476E-03	2,098008E-04	4,542451E+07	1,501620E+05

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 10.0

<CYC= 9 TIMDEL= 2,000000E-03 TIMTOT= 1,700000E-02 TTX= 1,042200E+01 DSMALL= 1,404905E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,359843E+06	1,684475E-09	1,622349E+03	3,007646E+23	2,552107E+09	2,149480E+00	0,	9,719687E+06	3,244698E+03
2	9,983896E+06	6,142733E-10	-3,602452E+02	2,212560E+23	4,356106E+09	1,337920E+00	6,615006E-02	1,024811E+07	-3,973168E+03
3	1,070402E+07	1,365476E-10	1,726393E+04	3,826459E+23	1,086688E+10	7,419232E-01	0,	1,115993E+07	3,650104E+04
4	1,163555E+07	5,099145E-11	5,090960E+04	4,003367E+23	1,949965E+10	4,971578E-01	0,	1,211117E+07	6,331816E+04
5	1,240844E+07	3,055483E-11	5,514587E+04	2,508192E+23	5,338400E+10	5,100212E-01	2,470912E-02	1,270572E+07	4,697358E+04
6	1,308844E+07	1,082037E-11	7,488432E+04	3,235833E+23	5,579492E+10	3,018607E-01	0,	1,347115E+07	1,027951E+05
7	1,455776E+07	2,372578E-12	1,314906E+05	9,228688E+23	1,221083E+11	1,448557E-01	0,	1,564436E+07	1,601861E+05
8	1,684436E+07	1,147916E-12	2,195967E+05	1,026344E+24	1,823924E+11	1,046856E-01	0,	1,804436E+07	2,790072E+05
9	1,931881E+07	7,287186E-13	3,141478E+05	1,098286E+24	2,488370E+11	9,066609E-02	0,	2,059326E+07	3,492845E+05
10	2,229685E+07	2,805742E-13	3,282717E+05	1,481465E+24	3,180315E+11	4,461572E-02	1,226994E-03	2,400045E+07	3,072549E+05
11	2,653515E+07	9,347163E-14	2,993875E+05	2,232639E+24	4,270359E+11	1,995787E-02	1,327052E-04	2,906966E+07	2,915201E+05
12	3,331062E+07	2,307473E-14	4,101457E+05	3,812070E+24	6,690239E+11	7,718771E-03	0,	3,755137E+07	5,287713E+05
13	4,182773E+07	8,714007E-15	4,143830E+05	3,942368E+24	5,800554E+11	2,527304E-03	3,620415E-04	4,610409E+07	2,999948E+05

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 10.0

<CYC= 13 TIMDEL= 3,000000E-03 TIMTOT= 2,000000E-02 TTX= 1,043200E+01 DSMALL= 1,240128E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,328366E+06	1,846131E-09	-5,124434E+03	2,744282E+23	4,965828E+09	4,583784E+00	2,857661E-01	9,656732E+06	-1,024887E+04
2	9,898562E+06	6,712398E-10	1,201184E+03	2,024804E+23	1,319042E+10	4,426968E+00	0,	1,014043E+07	1,265124E+04
3	1,093650E+07	7,814518E-11	7,490371E+04	6,696191E+23	4,807151E+10	1,878278E+00	0,	1,173257E+07	1,371562E+05
4	1,257081E+07	2,884941E-11	2,051646E+05	7,075968E+23	7,309722E+10	1,054406E+00	0,	1,340905E+07	2,731723E+05
5	1,418842E+07	1,159095E-11	3,492867E+05	6,611827E+23	1,056697E+11	6,124064E-01	0,	1,496779E+07	4,254005E+05
6	1,560870E+07	6,411527E-12	4,686298E+05	5,460929E+23	2,094435E+11	6,714256E-01	0,	1,624961E+07	5,118591E+05
7	1,710775E+07	2,980852E-12	5,224145E+05	7,345479E+23	2,304366E+11	3,434487E-01	0,	1,796589E+07	5,324699E+05
8	1,872364E+07	1,807495E-12	5,817320E+05	6,518177E+23	2,721022E+11	2,459117E-01	0,	1,948138E+07	6,304941E+05
9	2,039301E+07	1,015388E-12	5,910617E+05	7,882118E+23	3,177235E+11	1,613064E-01	1,031341E-02	2,130469E+07	5,510292E+05
10	2,271703E+07	3,380035E-13	4,499410E+05	1,229753E+24	2,984728E+11	5,044238E-02	9,502566E-03	2,412938E+07	3,482524E+05
11	2,614363E+07	1,177507E-13	2,497900E+05	1,772290E+24	2,989628E+11	1,760154E-02	3,287812E-03	2,815828E+07	1,513272E+05
12	3,275799E+07	2,130907E-14	3,144762E+05	4,127936E+24	6,622003E+11	7,055436E-03	0,	3,735770E+07	4,776253E+05
13	4,191682E+07	8,171406E-15	4,228759E+05	4,204152E+24	7,180165E+11	2,933602E-03	1,459061E-04	4,697594E+07	3,681266E+05

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4.63E+02	4.63E+02	3.88E+05	1.73E+09	1.04E+05	3.42E+11	2.84E+13	7.52E+12	1.20E+09	1.00E+00	1.00E+00	1.11E+00	220.5	220.6
2	5.67E+02	5.67E+02	4.72E+05	1.90E+09	1.34E+05	4.51E+11	8.85E+12	2.17E+12	1.23E+09	1.00E+00	1.91E+00	3.77E-01	237.8	237.6
3	6.07E+02	6.07E+02	5.08E+05	1.13E+09	1.47E+05	3.42E+11	3.15E+12	6.80E+11	9.13E+08	1.00E+00	1.55E+01	1.55E-01	269.3	264.3
4	6.35E+02	6.35E+02	5.47E+05	5.57E+08	1.68E+05	1.61E+11	1.06E+12	2.07E+11	5.07E+08	1.00E+00	8.05E+01	6.91E-02	348.8	344.9
5	7.40E+02	7.40E+02	7.29E+05	4.33E+08	1.23E+06	6.30E+10	3.67E+11	6.80E+10	3.84E+08	1.00E+00	2.78E+02	3.58E-02	521.1	516.6
6	7.95E+02	7.95E+02	1.51E+06	2.63E+08	1.64E+07	3.33E+10	1.48E+11	2.48E+10	2.19E+08	1.00E+00	2.50E+05	2.00E-02	697.3	695.1
7	6.92E+02	6.92E+02	2.71E+06	7.30E+07	2.02E+07	1.85E+10	6.41E+10	9.82E+09	5.76E+07	1.00E+00	1.85E+06	1.06E-02	822.6	824.5
8	7.76E+02	7.76E+02	6.03E+06	5.01E+07	2.33E+07	1.02E+10	2.70E+10	3.76E+09	2.97E+07	3.02E+00	5.57E+06	5.63E-03	998.1	995.5
9	9.21E+02	9.21E+02	7.73E+06	3.24E+07	1.89E+07	5.53E+09	1.08E+10	1.34E+09	1.55E+07	2.01E+03	7.47E+06	3.00E-03	1219.4	1221.4
10	1.69E+03	1.69E+03	1.99E+07	5.68E+07	3.34E+07	2.81E+09	3.63E+09	3.65E+08	8.63E+06	3.13E+06	1.48E+07	1.81E-03	1850.4	1847.9
11	2.51E+03	2.51E+03	3.13E+07	3.76E+07	1.58E+07	1.33E+09	1.06E+09	8.61E+07	3.24E+06	1.70E+07	1.27E+07	9.21E-04	2486.0	2487.1
12	4.50E+03	4.50E+03	3.79E+07	2.37E+07	8.17E+06	5.47E+08	2.32E+08	1.53E+07	1.07E+06	2.24E+07	1.51E+07	5.33E-04	4201.3	4189.0
13	5.98E+03	5.98E+03	1.70E+07	5.78E+06	2.37E+06	1.90E+08	3.58E+07	2.05E+06	2.70E+05	7.04E+06	9.81E+06	2.20E-04	5805.0	5799.4

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5.23E+02	5.23E+02	4.38E+05	3.40E+09	1.17E+05	3.47E+11	2.85E+13	7.52E+12	1.25E+09	1.00E+00	1.00E+00	1.13E+00	225.4	225.4
2	6.61E+02	6.61E+02	5.46E+05	3.78E+09	1.53E+05	4.53E+11	8.80E+12	2.15E+12	1.17E+09	1.00E+00	1.98E+00	4.05E-01	255.1	254.3
3	6.36E+02	6.36E+02	5.38E+05	1.41E+09	1.59E+05	3.48E+11	3.18E+12	6.86E+11	1.04E+09	1.00E+00	1.60E+01	1.65E-01	281.7	282.6
4	7.42E+02	7.42E+02	6.42E+05	1.08E+09	1.98E+05	1.63E+11	1.05E+12	2.03E+11	6.25E+08	1.00E+00	8.83E+01	8.16E-02	416.3	414.9
5	8.92E+02	8.92E+02	9.19E+05	8.64E+08	7.13E+06	6.45E+10	3.59E+11	6.50E+10	6.61E+08	1.00E+00	3.60E+02	4.44E-02	660.0	652.3
6	8.43E+02	8.43E+02	1.81E+06	3.49E+08	2.03E+07	3.49E+10	1.50E+11	2.45E+10	2.78E+08	1.00E+00	3.80E+05	2.36E-02	808.1	808.6
7	8.19E+02	8.19E+02	5.26E+06	1.41E+08	3.73E+07	1.91E+10	6.42E+10	9.55E+09	9.54E+07	1.13E+00	4.17E+06	1.23E-02	948.7	951.5
8	9.72E+02	9.72E+02	1.19E+07	9.51E+07	4.59E+07	1.04E+10	2.70E+10	3.65E+09	4.41E+07	6.01E+00	1.12E+07	6.61E-03	1149.9	1150.6
9	1.19E+03	1.19E+03	1.62E+07	7.08E+07	4.19E+07	5.69E+09	1.09E+10	1.30E+09	2.04E+07	5.18E+03	1.58E+07	3.54E-03	1404.7	1412.7
10	3.07E+03	3.07E+03	5.34E+07	1.79E+08	7.65E+07	2.98E+09	3.48E+09	2.64E+08	1.24E+07	1.72E+07	3.07E+07	3.14E-03	3100.4	3085.4
11	4.71E+03	4.71E+03	9.35E+07	1.16E+08	3.26E+07	1.38E+09	9.84E+08	5.45E+07	3.28E+06	6.22E+07	2.96E+07	1.82E-03	4588.8	4584.3
12	7.36E+03	7.36E+03	8.46E+07	5.42E+07	1.67E+07	5.32E+08	1.93E+08	1.01E+07	2.29E+06	5.12E+07	3.28E+07	1.02E-03	7547.2	7493.5
13	8.10E+03	8.10E+03	2.93E+07	9.64E+06	4.08E+06	1.84E+08	3.06E+07	1.66E+06	4.08E+05	1.21E+07	1.70E+07	3.52E-04	8779.6	8784.1

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6.25E+02	6.25E+02	5.22E+05	1.03E+10	1.42E+05	3.58E+11	2.84E+13	7.51E+12	3.64E+08	1.00E+00	1.00E+00	1.20E+00	238.5	238.4
2	7.65E+02	7.65E+02	6.31E+05	7.85E+09	1.75E+05	4.61E+11	8.79E+12	2.15E+12	5.75E+08	1.00E+00	2.08E+00	4.47E-01	263.2	262.2
3	7.54E+02	7.54E+02	6.42E+05	2.76E+09	1.92E+05	3.59E+11	3.20E+12	6.85E+11	1.24E+09	1.00E+00	1.78E+01	2.02E-01	341.4	343.1
4	9.37E+02	9.37E+02	8.06E+05	2.16E+09	2.45E+05	1.69E+11	1.01E+12	1.90E+11	1.24E+09	1.00E+00	1.02E+02	1.14E-01	603.3	594.4
5	1.05E+03	1.05E+03	1.13E+06	1.25E+09	7.71E+05	6.91E+10	3.52E+11	6.06E+10	1.09E+09	1.00E+00	6.04E+02	6.10E-02	921.9	905.4
6	9.00E+02	9.00E+02	2.34E+06	4.41E+08	2.11E+07	3.83E+10	1.54E+11	2.39E+10	3.76E+08	1.00E+00	6.61E+05	3.13E-02	1027.0	1036.5
7	1.09E+03	1.09E+03	1.09E+07	3.26E+08	7.35E+07	2.05E+10	6.46E+10	8.96E+09	2.03E+08	2.73E+00	9.24E+06	1.66E-02	1262.2	1264.7
8	1.55E+03	1.55E+03	2.02E+07	2.54E+08	1.14E+08	1.13E+10	2.65E+10	3.10E+09	1.02E+08	1.86E+01	2.49E+07	1.02E-02	1769.0	1763.4
9	2.15E+03	2.15E+03	4.15E+07	2.82E+08	1.31E+08	6.45E+09	1.12E+10	1.13E+09	4.89E+07	1.12E+05	4.00E+07	6.35E-03	2242.5	2341.0
10	7.15E+03	7.15E+03	2.37E+08	9.30E+08	1.29E+08	3.24E+09	2.78E+09	4.49E+07	5.83E+07	1.88E+08	4.41E+07	7.74E-03	7337.2	7177.5
11	1.04E+04	1.04E+04	3.01E+08	5.36E+08	1.30E+08	1.32E+09	6.04E+08	1.71E+07	3.35E+07	2.28E+08	6.93E+07	4.98E-03	11165.2	11013.3
12	1.32E+04	1.32E+04	1.81E+08	1.15E+08	4.37E+07	4.95E+08	1.17E+08	3.76E+06	8.28E+06	1.09E+08	7.04E+07	2.24E-03	14389.7	14246.5
13	1.23E+04	1.23E+04	5.22E+07	1.57E+07	6.95E+06	1.75E+08	2.21E+07	1.12E+06	6.18E+05	2.14E+07	3.06E+07	6.38E-04	14353.0	14441.4

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	8.23E+02	8.23E+02	6.80E+05	4.78E+10	1.83E+05	3.83E+11	2.81E+13	7.42E+12	1.09E+07	1.00E+00	1.00E+00	1.38E+00	279.6	276.6
2	9.17E+02	9.17E+02	7.72E+05	1.95E+10	2.22E+05	4.93E+11	9.04E+12	2.20E+12	8.95E+07	1.00E+00	2.31E+00	5.63E-01	343.6	345.6
3	1.04E+03	1.04E+03	6.69E+05	7.07E+09	2.49E+05	3.93E+11	3.09E+12	6.40E+11	1.32E+09	1.00E+00	2.26E+01	3.43E-01	597.3	594.0
4	1.39E+03	1.39E+03	1.18E+06	4.84E+08	1.88E+05	1.86E+11	6.91E+11	1.46E+11	5.81E+09	1.00E+00	1.23E+02	2.02E-01	1242.3	1175.4
5	1.14E+03	1.14E+03	1.39E+06	6.58E+08	8.23E+05	8.90E+10	3.75E+11	5.64E+10	2.34E+09	1.00E+00	1.90E+03	1.09E-01	1467.8	1492.2
6	1.37E+03	1.37E+03	4.33E+06	8.07E+08	2.63E+07	4.68E+10	1.55E+11	1.97E+10	1.32E+09	1.00E+00	1.35E+06	5.49E-02	1806.5	1673.2
7	2.08E+03	2.08E+03	1.54E+07	1.16E+09	1.66E+08	2.88E+10	7.30E+10	7.29E+09	9.50E+08	1.21E+01	1.04E+07	4.23E-02	2533.3	2662.6
8	5.47E+03	5.47E+03	1.55E+07	2.40E+09	4.08E+08	1.57E+10	2.27E+10	2.56E+08	4.86E+08	1.05E+05	1.99E+06	3.44E-02	6046.7	5662.3
9	8.55E+03	8.55E+03	9.07E+07	7.92E+09	1.08E+09	7.86E+09	6.77E+09	1.00E+00	6.09E+08	4.42E+07	8.95E+06	3.36E-02	9835.3	9456.5
10	1.33E+04	1.33E+04	1.70E+09	2.88E+09	1.42E+09	2.54E+09	2.73E+08	1.00E+00	1.94E+07	1.41E+09	2.72E+08	2.24E-02	16457.0	15429.4
11	2.13E+04	2.13E+04	1.24E+09	5.49E+08	4.41E+08	9.77E+08	6.04E+07	1.00E+00	5.71E+06	8.74E+08	3.58E+08	1.38E-02	23225.2	22347.1
12	2.30E+04	2.30E+04	4.17E+08	1.14E+08	9.18E+07	3.92E+08	3.05E+07	2.37E+05	5.04E+06	2.37E+08	1.78E+08	5.61E-03	30083.6	29711.6
13	1.98E+04	1.98E+04	9.86E+07	2.02E+07	1.11E+07	1.64E+08	1.27E+07	5.68E+05	9.68E+05	3.88E+07	5.96E+07	1.24E-03	23217.6	23975.3

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.18E+03	1.18E+03	9.56E+05	1.13E+11	2.49E+05	5.46E+11	2.76E+13	7.21E+12	1.03E+09	1.00E+00	1.00E+00	2.20E+00	442.5	436.6
2	1.28E+03	1.28E+03	1.17E+06	4.38E+09	3.73E+05	7.60E+11	1.01E+13	2.34E+12	7.61E+09	1.00E+00	3.67E+00	1.37E+00	708.3	733.3
3	1.91E+03	1.91E+03	1.55E+06	1.00E+00	1.00E+00	4.86E+11	2.23E+12	3.46E+11	4.80E+10	1.00E+00	3.20E+01	7.42E-01	1917.2	1740.6
4	2.09E+03	2.09E+03	3.52E+06	1.01E+00	1.00E+00	2.80E+11	8.27E+11	7.61E+10	2.65E+10	1.00E+00	1.62E+02	4.97E-01	3184.9	2488.9
5	2.37E+03	2.37E+03	5.85E+06	3.79E+07	2.51E+06	1.99E+11	4.94E+11	2.91E+10	1.11E+10	1.00E+00	4.97E+02	5.10E-01	4560.5	5012.0
6	5.64E+03	5.64E+03	4.87E+07	2.09E+10	2.04E+07	9.32E+10	1.58E+11	1.00E+00	1.27E+10	4.58E+00	2.90E+02	2.86E-01	6124.4	7710.4
7	9.05E+03	9.05E+03	4.09E+09	6.03E+10	1.61E+10	1.71E+10	2.94E+08	1.00E+00	1.37E+07	3.49E+09	4.28E+08	1.46E-01	11366.4	10324.3
8	1.08E+04	1.08E+04	2.53E+10	1.26E+10	3.29E+09	6.72E+09	3.75E+02	1.00E+00	1.00E+00	2.02E+10	5.11E+09	1.05E-01	11542.7	10352.7
9	1.30E+04	1.30E+04	1.92E+10	5.31E+09	1.85E+09	4.43E+09	1.00E+00	1.00E+00	1.02E+00	1.46E+10	4.57E+09	9.06E-02	13546.9	13281.9
10	1.51E+04	1.51E+04	9.56E+09	7.10E+08	3.22E+08	9.47E+08	5.07E+00	1.00E+00	1.00E+00	6.74E+09	2.81E+09	4.46E-02	15072.5	15360.3
11	2.07E+04	2.07E+04	3.15E+09	1.60E+08	1.18E+08	3.65E+08	3.81E+05	1.00E+00	6.24E+03	1.97E+09	1.18E+09	2.00E-02	20738.2	20847.6
12	2.30E+04	2.30E+04	6.85E+08	4.04E+07	3.39E+07	1.59E+08	1.12E+06	4.33E+02	9.98E+04	3.55E+08	3.32E+08	7.72E-03	47322.0	44690.6
13	2.30E+04	2.30E+04	1.62E+08	1.85E+07	1.36E+07	1.30E+08	4.43E+06	1.62E+05	4.98E+05	6.02E+07	1.01E+08	2.53E-03	40945.9	42904.6

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 6.00 TDAT2 = 10.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.56E+03	1.56E+03	1.36E+06	1.78E+05	3.92E+05	1.15E+12	3.03E+13	7.61E+12	2.80E+10	1.00E+00	1.00E+00	4.58E+00	828.5	848.6
2	1.99E+03	1.99E+03	2.74E+06	8.69E+05	2.33E+06	1.65E+12	1.10E+13	2.07E+12	1.42E+11	1.00E+00	6.82E+00	4.43E+00	2175.6	2163.0
3	3.36E+03	3.36E+03	4.75E+06	4.50E+10	9.00E+07	8.69E+11	1.32E+12	1.00E+00	4.49E+10	1.00E+00	3.54E+01	1.76E+00	7258.7	6026.6
4	4.83E+03	4.83E+03	5.49E+08	1.91E+11	2.96E+08	4.43E+11	3.84E+11	1.00E+00	2.86E+10	5.94E+00	9.28E+01	1.12E+00	4072.8	7479.3
5	1.04E+04	1.04E+04	1.02E+10	2.97E+11	9.28E+10	9.27E+10	2.95E+06	1.00E+00	1.57E+00	3.67E+09	5.63E+09	6.21E-01	11777.9	8477.2
6	1.09E+04	1.09E+04	1.32E+11	9.99E+10	2.17E+10	1.99E+10	1.91E+00	1.00E+00	1.00E+00	9.18E+10	4.00E+10	6.77E-01	12040.1	11907.2
7	1.13E+04	1.13E+04	8.90E+10	2.22E+10	6.29E+09	6.61E+09	1.00E+00	1.00E+00	1.00E+00	6.71E+10	2.18E+10	3.45E-01	12849.6	11630.6
8	1.26E+04	1.26E+04	6.52E+10	6.85E+09	2.18E+09	2.90E+09	1.00E+00	1.00E+00	1.00E+00	4.75E+10	1.56E+10	2.46E-01	13957.9	13219.9
9	1.33E+04	1.33E+04	3.91E+10	1.62E+09	4.95E+08	8.07E+08	1.00E+00	1.00E+00	1.00E+00	2.85E+10	1.08E+10	1.61E-01	13068.6	14651.6
10	1.26E+04	1.26E+04	1.55E+10	1.68E+08	4.87E+07	1.45E+08	1.00E+00	1.00E+00	1.00E+00	9.15E+09	4.38E+09	5.04E-02	12240.9	13394.4
11	1.27E+04	1.27E+04	4.75E+09	1.51E+07	4.49E+06	1.82E+07	1.00E+00	1.00E+00	1.00E+00	2.81E+09	1.93E+09	1.76E-02	12467.2	13525.9
12	2.30E+04	2.30E+04	7.94E+08	1.05E+07	8.79E+06	3.75E+07	4.89E+03	1.00E+00	1.41E+02	3.78E+08	4.16E+08	7.06E-03	43429.0	40240.7
13	2.30E+04	2.30E+04	1.81E+08	1.46E+07	1.12E+07	1.07E+08	2.02E+06	6.53E+04	2.35E+05	6.55E+07	1.16E+08	2.93E-03	52414.5	53675.5

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 30,0

KCYC= 9 TIMDEL= 1,000000E-03 TIMTOT= 3,500000E-02 TTX= 1,093300E+01 DSMALL= 9,487980E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,349790E+06	1,732942E-09	2,518627E+01	2,923527E+23	1,279409E+09	1,108571E+00	0,	9,699580E+06	5,037254E+01
2	1,000764E+07	5,267883E-10	4,748744E+02	2,580029E+23	1,387966E+09	3,655820E-01	0,	1,031571E+07	8,993763E+02
3	1,064262E+07	1,904641E-10	1,147637E+03	2,743266E+23	1,623086E+09	1,545697E-01	0,	1,096954E+07	1,395898E+03
4	1,134628E+07	6,443093E-11	1,803684E+03	3,168315E+23	2,133319E+09	6,872565E-02	0,	1,172303E+07	2,211471E+03
5	1,216700E+07	2,047432E-11	4,404121E+03	3,743097E+23	3,065579E+09	3,138282E-02	0,	1,261097E+07	6,596771E+03
6	1,309997E+07	8,468337E-12	8,902025E+03	4,134566E+23	4,246936E+09	1,798224E-02	0,	1,358897E+07	1,120728E+04
7	1,421284E+07	4,136714E-12	1,059747E+04	5,293038E+23	5,411464E+09	1,119264E-02	7,302992E-05	1,483671E+07	9,987656E+03
8	1,561800E+07	1,769736E-12	8,300930E+03	6,657248E+23	6,694580E+09	5,923821E-03	9,103086E-05	1,639929E+07	6,614203E+03
9	1,764122E+07	7,516424E-13	3,045728E+03	1,064790E+24	8,536083E+09	3,208041E-03	9,862933E-05	1,888314E+07	-5,227468E+02
10	2,075383E+07	2,567120E-13	3,780240E+03	1,619172E+24	1,359254E+10	1,744684E-03	0,	2,262453E+07	8,083228E+03
11	2,521070E+07	9,197800E-14	8,401340E+03	2,268895E+24	2,108839E+10	9,698340E-04	0,	2,779688E+07	8,719453E+03
12	3,156238E+07	2,612320E-14	2,527702E+04	3,367217E+24	3,791067E+10	4,951740E-04	0,	3,532788E+07	4,183459E+04
13	4,045018E+07	7,304481E-15	4,993940E+04	4,703117E+24	5,846425E+10	2,135255E-04	0,	4,557247E+07	5,804421E+04

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 30,0

KCYC= 9 TIMDEL= 1,000000E-03 TIMTOT= 3,600000E-02 TTX= 1,094200E+01 DSMALL= 8,378613E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,350043E+06	1,731689E-09	1,208691E+02	2,925644E+23	1,309063E+09	1,133445E+00	0,	9,700086E+06	2,417383E+02
2	1,002030E+07	5,067839E-10	1,026746E+03	2,681871E+23	1,467818E+09	3,719332E-01	0,	1,034051E+07	1,811754E+03
3	1,065093E+07	2,005768E-10	2,001657E+03	2,604956E+23	1,743002E+09	1,748028E-01	0,	1,096136E+07	2,191560E+03
4	1,136734E+07	5,978705E-11	3,958786E+03	3,414410E+23	2,475601E+09	7,400442E-02	0,	1,177333E+07	5,726012E+03
5	1,227323E+07	1,817749E-11	9,940367E+03	4,216058E+23	3,705738E+09	3,368051E-02	0,	1,277314E+07	1,415472E+04
6	1,324162E+07	8,835199E-12	1,695419E+04	3,962887E+23	5,042917E+09	2,227759E-02	0,	1,371011E+07	1,975366E+04
7	1,431973E+07	4,232066E-12	1,824377E+04	5,173781E+23	6,379460E+09	1,349915E-02	2,122912E-04	1,492734E+07	1,673369E+04
8	1,569371E+07	1,808516E-12	1,306566E+04	6,514498E+23	7,901099E+09	7,144633E-03	2,123990E-04	1,645807E+07	9,397427E+03
9	1,757264E+07	8,376987E-13	-4,412477E+02	9,554045E+23	1,051902E+10	4,405886E-03	3,864287E-04	1,868721E+07	-1,027992E+04
10	2,076930E+07	2,306375E-13	6,022846E+03	1,802226E+24	2,330080E+10	2,687019E-03	0,	2,285138E+07	2,232561E+04
11	2,557148E+07	8,735457E-14	3,392899E+04	2,388981E+24	4,129816E+10	1,803792E-03	0,	2,829157E+07	4,553237E+04
12	3,239918E+07	2,388757E-14	8,032221E+04	3,682353E+24	7,076605E+10	8,452145E-04	0,	3,650680E+07	1,151120E+05
13	4,144378E+07	7,556500E-15	1,140008E+05	4,546262E+24	9,433443E+10	3,564191E-04	3,290341E-08	4,638075E+07	1,128895E+05

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 30,0

KCYC= 9 TIMDEL= 1,000000E-03 TIMTOT= 3,700000E-02 TTX= 1,095000E+01 DSMALL= 5,885327E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,355159E+06	1,706718E-09	4,248230E+02	2,968447E+23	1,374941E+09	1,173319E+00	0,	9,710317E+06	8,496460E+02
2	1,003085E+07	5,062680E-10	1,589650E+03	2,684604E+23	1,627345E+09	4,119362E-01	0,	1,035137E+07	2,329654E+03
3	1,066803E+07	1,960192E-10	4,141270E+03	2,657388E+23	2,106036E+09	2,070436E-01	0,	1,098468E+07	5,952887E+03
4	1,148018E+07	4,897089E-11	1,121243E+04	4,168547E+23	3,312073E+09	8,109758E-02	0,	1,197565E+07	1,647198E+04
5	1,251939E+07	1,669937E-11	2,191353E+04	4,589238E+23	5,058282E+09	4,223507E-02	0,	1,306313E+07	2,735508E+04
6	1,349541E+07	9,567663E-12	3,153778E+04	3,659503E+23	6,686857E+09	3,198879E-02	0,	1,392770E+07	3,572049E+04
7	1,448800E+07	4,602161E-12	3,206338E+04	4,757718E+23	9,043032E+09	2,080874E-02	7,050218E-04	1,504830E+07	2,840626E+04
8	1,578752E+07	1,869496E-12	1,586116E+04	6,302006E+23	1,281603E+10	1,197976E-02	8,898183E-04	1,652674E+07	3,310052E+03
9	1,739725E+07	1,073130E-12	-2,358275E+03	7,458004E+23	2,033491E+10	1,091100E-02	6,850885E-04	1,826777E+07	-8,032603E+03
10	2,097550E+07	1,772351E-13	3,085385E+04	2,345251E+24	5,430578E+10	4,812446E-03	0,	2,368323E+07	6,974030E+04
11	2,728083E+07	6,570773E-14	1,352429E+05	3,176010E+24	1,029011E+11	3,380700E-03	0,	3,087844E+07	2,007455E+05
12	3,521142E+07	2,245606E-14	2,493329E+05	3,917092E+24	1,514763E+11	1,700781E-03	0,	3,954440E+07	2,979203E+05
13	4,387969E+07	8,543839E-15	2,723357E+05	4,020889E+24	1,769478E+11	7,559067E-04	3,716424E-05	4,821498E+07	2,467511E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 30,0

KCYC= 13 TIMDEL= 2,000000E-03 TIMTOT= 3,900000E-02 TTX= 1,095900E+01 DSMALL= 3,577176E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,374115E+06	1,620146E-09	1,001918E+03	3,127067E+23	1,571303E+09	1,272870E+00	0,	9,748230E+06	2,003837E+03
2	1,003870E+07	5,586409E-10	3,758062E+03	2,432920E+23	2,057836E+09	5,747956E-01	0,	1,032917E+07	5,512267E+03
3	1,075541E+07	1,460311E-10	1,315229E+04	3,577960E+23	3,244620E+09	2,369078E-01	0,	1,118164E+07	2,079228E+04
4	1,188956E+07	3,423195E-11	2,876044E+04	5,963361E+23	5,833079E+09	9,983885E-02	0,	1,259749E+07	3,672860E+04
5	1,306159E+07	1,953216E-11	4,008512E+04	3,923651E+23	8,826414E+09	8,619948E-02	0,	1,352570E+07	4,344164E+04
6	1,388131E+07	1,161672E-11	5,598516E+04	3,014008E+23	1,371091E+10	7,963792E-02	0,	1,423692E+07	6,852868E+04
7	1,471885E+07	5,346884E-12	7,021930E+04	4,095055E+23	2,050426E+10	5,481694E-02	0,	1,520077E+07	7,190991E+04
8	1,599171E+07	1,746144E-12	6,763744E+04	6,747196E+23	4,868038E+10	4,250147E-02	1,427823E-03	1,678265E+07	6,336496E+04
9	1,872422E+07	4,791983E-13	1,141537E+05	1,670167E+24	7,198507E+10	1,724756E-02	0,	2,066580E+07	1,649424E+05
10	2,439576E+07	1,273346E-13	2,355064E+05	3,264320E+24	1,597481E+11	1,017073E-02	0,	2,812571E+07	3,060704E+05
11	3,325801E+07	4,524122E-14	4,395640E+05	4,612793E+24	2,509731E+11	5,677164E-03	0,	3,839031E+07	5,730576E+05
12	4,309575E+07	2,020191E-14	6,469088E+05	4,354165E+24	3,586702E+11	3,622912E-03	0,	4,780119E+07	7,207600E+05
13	5,060423E+07	1,295718E-14	7,193974E+05	2,651336E+24	3,992797E+11	2,586769E-03	6,541559E-05	5,340726E+07	7,180349E+05

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 30,0

KCYC= 22 TIMDEL= 3,000000E-03 TIMTOT= 4,200000E-02 TTX= 1,096900E+01 DSMALL= 2,758361E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,406303E+06	1,491645E-09	4,326247E+03	3,396454E+23	2,572200E+09	1,918405E+00	0,	9,812606E+06	8,652493E+03
2	1,023241E+07	3,863089E-10	2,302308E+04	3,518244E+23	3,519952E+09	6,798944E-01	0,	1,065220E+07	3,739366E+04
3	1,135152E+07	8,884226E-11	4,268968E+04	5,881139E+23	8,705193E+09	3,866945E-01	0,	1,205084E+07	4,796569E+04
4	1,289127E+07	2,874611E-11	8,495676E+04	7,101395E+23	1,441100E+10	2,071300E-01	0,	1,373169E+07	1,219278E+05
5	1,463050E+07	1,003706E-11	1,390429E+05	7,635444E+23	1,825521E+10	9,161429E-02	0,	1,552931E+07	1,561560E+05
6	1,653000E+07	4,094825E-12	2,005154E+05	8,550523E+23	3,678013E+10	7,530410E-02	0,	1,753069E+07	2,448728E+05
7	1,924616E+07	1,481429E-12	3,005388E+05	1,478018E+24	9,744342E+10	7,217776E-02	0,	2,096162E+07	3,562048E+05
8	2,289800E+07	6,983878E-13	3,901615E+05	1,686968E+24	1,429677E+11	4,992345E-02	0,	2,483438E+07	4,241162E+05
9	2,760588E+07	3,267899E-13	4,843948E+05	2,449100E+24	1,642813E+11	2,684273E-02	0,	3,037738E+07	5,446715E+05
10	3,337300E+07	1,543327E-13	6,780929E+05	2,693278E+24	2,307282E+11	1,780446E-02	0,	3,636801E+07	8,115142E+05
11	3,956374E+07	7,132317E-14	9,308317E+05	2,925955E+24	3,708630E+11	1,322556E-02	0,	4,275887E+07	1,050149E+06
12	4,774216E+07	1,881751E-14	9,956658E+05	4,674500E+24	6,028405E+11	5,671980E-03	2,376412E-04	5,272546E+07	9,411825E+05
13	5,676489E+07	8,832223E-15	1,056419E+06	3,889602E+24	5,873285E+11	2,593708E-03	0,	6,080432E+07	1,171655E+06

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 30,0

KCYC= 32 TIMDEL= 5,000000E-03 TIMTOT= 4,700000E-02 TTX= 1,098100E+01 DSMALL= 1,858278E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,449014E+06	1,348377E-09	2,053745E+04	3,757334E+23	4,223275E+09	2,847284E+00	0,	9,898827E+06	4,107491E+04
2	1,065534E+07	2,140869E-10	6,000108E+04	6,348492E+23	7,214992E+09	7,723175E-01	0,	1,141166E+07	7,892726E+04
3	1,341429E+07	3,083041E-11	1,477632E+05	1,694735E+24	3,070745E+10	4,733616E-01	0,	1,541671E+07	2,165991E+05
4	1,789865E+07	9,584840E-12	2,996905E+05	2,129796E+24	4,945338E+10	2,370014E-01	0,	2,038098E+07	3,827819E+05
5	2,226545E+07	4,676992E-12	4,500947E+05	1,638604E+24	6,872642E+10	1,607165E-01	0,	2,414993E+07	5,174076E+05
6	2,626823E+07	1,878016E-12	5,695828E+05	1,864355E+24	1,112807E+11	1,044935E-01	0,	2,838653E+07	6,217580E+05
7	3,067012E+07	1,075121E-12	7,074206E+05	2,036589E+24	1,359700E+11	7,309207E-02	0,	3,295371E+07	7,930833E+05
8	3,465293E+07	7,682514E-13	8,984958E+05	1,533557E+24	1,738921E+11	6,679642E-02	0,	3,635215E+07	1,003908E+06
9	3,790209E+07	5,666558E-13	1,091634E+06	1,412394E+24	2,347871E+11	6,652173E-02	0,	3,945203E+07	1,179360E+06
10	4,141683E+07	2,297563E-13	1,250091E+06	1,809138E+24	2,457002E+11	2,822559E-02	0,	4,338164E+07	1,320823E+06
11	4,604800E+07	8,385152E-14	1,459445E+06	2,488785E+24	2,511954E+11	1,053156E-02	0,	4,871444E+07	1,598068E+06
12	5,128665E+07	3,608228E-14	1,596854E+06	2,437830E+24	9,599723E+11	1,731899E-02	5,992692E-04	5,385886E+07	1,595640E+06
13	5,792057E+07	8,754604E-15	1,388535E+06	3,924087E+24	7,455425E+11	3,263465E-03	6,472650E-04	6,198227E+07	1,181430E+06

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	U2	NU	NP	OP	PRES	TEM(1)	TEM(2)
1	4,53E+02	4,53E+02	1,28E+05	1,08E+09	3,06E+04	3,43E+11	2,85E+13	7,53E+12	5,47E+08	1,00E+00	1,00E+00	1,11E+00	221,0	221,0
2	5,63E+02	5,63E+02	1,60E+05	1,16E+09	5,70E+04	4,41E+11	8,65E+12	2,12E+12	5,25E+08	1,00E+00	1,92E+00	3,66E-01	237,7	236,1
3	6,05E+02	6,05E+02	1,82E+05	7,45E+08	6,12E+04	3,40E+11	3,13E+12	6,76E+11	5,39E+08	1,00E+00	1,55E+01	1,55E-01	270,8	270,1
4	6,35E+02	6,35E+02	1,91E+05	4,31E+08	6,58E+04	1,60E+11	1,06E+12	2,06E+11	3,86E+08	1,00E+00	8,04E+01	6,89E-02	350,3	349,3
5	7,40E+02	7,40E+02	2,02E+05	3,20E+08	6,90E+04	5,76E+10	3,36E+11	6,22E+10	3,18E+08	1,00E+00	2,55E+02	3,15E-02	511,0	498,4
6	7,95E+02	7,95E+02	2,62E+05	2,08E+08	1,60E+05	3,10E+10	1,38E+11	2,30E+10	2,16E+08	1,00E+00	8,37E+02	1,80E-02	692,9	677,8
7	6,92E+02	6,92E+02	3,85E+05	7,10E+07	2,31E+06	1,92E+10	6,63E+10	1,01E+10	7,60E+07	1,00E+00	3,52E+04	1,12E-02	840,0	846,5
8	7,79E+02	7,79E+02	1,64E+06	5,15E+07	9,61E+06	1,04E+10	2,77E+10	3,83E+09	4,47E+07	2,61E+00	1,24E+06	5,95E-03	1013,2	1021,2
9	9,29E+02	9,29E+02	4,56E+06	3,59E+07	1,37E+07	5,77E+09	1,12E+10	1,39E+09	2,19E+07	1,73E+01	4,30E+06	3,22E-03	1242,0	1257,5
10	1,74E+03	1,74E+03	1,11E+07	6,22E+07	2,83E+07	2,73E+09	3,50E+09	3,44E+08	1,33E+07	3,43E+04	1,07E+07	1,76E-03	1903,3	1883,5
11	2,64E+03	2,64E+03	1,87E+07	4,69E+07	1,75E+07	1,37E+09	1,07E+09	7,49E+07	3,68E+06	6,07E+06	1,13E+07	9,96E-04	2684,4	2685,2
12	4,46E+03	4,46E+03	3,10E+07	2,74E+07	7,33E+06	5,22E+08	2,16E+08	1,10E+07	9,33E+05	1,73E+07	1,34E+07	5,05E-04	4298,1	4214,0
13	5,50E+03	5,50E+03	1,62E+07	6,36E+06	2,26E+06	1,86E+08	3,48E+07	1,83E+06	2,51E+05	6,66E+06	9,43E+06	2,14E-04	5848,8	5806,6

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NU	NP	OP	PRES	TEM(1)	TEM(2)
1	5,10E+02	5,10E+02	1,45E+05	2,41E+09	3,42E+04	3,47E+11	2,84E+13	7,52E+12	2,58E+08	1,00E+00	1,00E+00	1,13E+00	226,2	226,1
2	6,55E+02	6,55E+02	1,75E+05	2,63E+09	6,20E+04	4,30E+11	8,32E+12	2,04E+12	2,08E+08	1,00E+00	1,97E+00	3,73E-01	253,3	249,7
3	6,35E+02	6,35E+02	1,96E+05	9,47E+08	6,60E+04	3,60E+11	3,29E+12	7,11E+11	5,33E+08	1,00E+00	1,62E+01	1,75E-01	288,4	289,9
4	7,41E+02	7,41E+02	1,97E+05	6,86E+08	7,22E+04	1,53E+11	9,81E+11	1,89E+11	5,08E+08	1,00E+00	8,64E+01	7,43E-02	413,1	404,8
5	8,92E+02	8,92E+02	2,29E+05	4,79E+08	6,87E+04	5,37E+10	2,98E+11	5,39E+10	4,88E+08	1,00E+00	2,71E+02	3,39E-02	631,1	601,1
6	8,43E+02	8,43E+02	2,91E+05	2,61E+08	1,50E+05	3,35E+10	1,44E+11	2,34E+10	2,77E+08	1,00E+00	9,16E+02	2,24E-02	818,1	802,4
7	8,20E+02	8,20E+02	5,83E+05	1,32E+08	3,63E+06	2,02E+10	6,78E+10	1,00E+10	1,31E+08	1,00E+00	8,93E+04	1,35E-02	980,1	994,5
8	9,76E+02	9,76E+02	2,91E+06	9,80E+07	1,77E+07	1,09E+10	2,82E+10	3,75E+09	7,46E+07	5,12E+00	2,34E+06	7,20E-03	1181,1	1200,4
9	1,21E+03	1,21E+03	9,30E+06	8,79E+07	3,07E+07	6,57E+09	1,25E+10	1,47E+09	3,73E+07	4,00E+01	8,86E+06	4,45E-03	1478,3	1540,8
10	3,25E+03	3,25E+03	1,65E+07	1,85E+08	5,74E+07	2,69E+09	3,04E+09	2,00E+08	2,61E+07	6,16E+05	1,46E+07	2,73E-03	3246,8	3124,6
11	5,11E+03	5,11E+03	5,55E+07	1,53E+08	2,69E+07	1,39E+09	9,33E+08	2,77E+07	3,90E+06	3,42E+07	2,04E+07	1,87E-03	5014,3	4936,0
12	7,09E+03	7,09E+03	6,34E+07	6,78E+07	1,31E+07	4,75E+08	1,61E+08	4,41E+06	3,34E+06	3,80E+07	2,50E+07	8,60E-04	7507,7	7204,5
13	7,78E+03	7,78E+03	2,86E+07	1,19E+07	3,84E+06	1,86E+08	2,99E+07	1,42E+06	7,10E+05	1,18E+07	1,66E+07	3,57E-04	8875,3	8684,4

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	U2	NU	NP	OP	PRES	TEM(1)	TEM(2)
1	6,08E+02	6,08E+02	1,71E+05	9,79E+09	3,96E+04	3,53E+11	2,80E+13	7,40E+12	2,96E+06	1,00E+00	1,00E+00	1,17E+00	238,5	237,4
2	7,58E+02	7,58E+02	2,02E+05	6,85E+09	6,76E+04	4,36E+11	8,31E+12	2,03E+12	1,42E+07	1,00E+00	2,06E+00	4,12E-01	280,6	276,6
3	7,52E+02	7,52E+02	2,10E+05	1,87E+09	7,93E+04	3,64E+11	3,23E+12	6,91E+11	3,51E+08	1,00E+00	1,78E+01	2,08E-01	353,2	349,9
4	9,37E+02	9,37E+02	2,18E+05	8,98E+08	6,48E+04	1,35E+11	8,04E+11	1,50E+11	6,26E+08	1,00E+00	9,58E+01	8,18E-02	573,6	539,9
5	1,05E+03	1,05E+03	2,61E+05	4,17E+08	7,13E+04	5,43E+10	2,74E+11	4,69E+10	8,99E+08	1,00E+00	3,08E+02	4,27E-02	866,9	815,2
6	9,00E+02	9,00E+02	3,31E+05	2,65E+08	1,39E+05	3,88E+10	1,56E+11	2,40E+10	4,23E+08	1,00E+00	1,08E+03	3,21E-02	1078,8	1058,0
7	1,09E+03	1,09E+03	9,26E+05	2,56E+08	5,29E+06	2,36E+10	7,35E+10	1,00E+10	2,99E+08	1,83E+00	1,50E+05	2,10E-02	1348,2	1398,7
8	1,56E+03	1,56E+03	4,65E+06	2,31E+08	3,83E+07	1,25E+10	2,90E+10	3,25E+09	1,95E+08	1,47E+01	3,47E+06	1,22E-02	1833,5	1918,1
9	2,23E+03	2,23E+03	1,50E+07	3,74E+08	9,15E+07	9,27E+09	1,57E+10	1,42E+09	1,55E+08	1,67E+02	1,29E+07	1,12E-02	2684,4	2907,5
10	7,13E+03	7,13E+03	4,62E+07	9,83E+08	1,10E+08	2,41E+09	1,90E+09	4,67E+06	3,73E+07	3,72E+07	5,92E+06	5,03E-03	6940,5	6359,7
11	9,31E+03	9,31E+03	1,18E+08	6,97E+08	1,43E+08	1,05E+09	3,55E+08	3,29E+04	2,97E+07	8,91E+07	2,58E+07	3,48E-03	10875,1	9966,2
12	1,17E+04	1,17E+04	1,23E+08	1,53E+08	5,19E+07	4,23E+08	7,21E+07	4,38E+05	8,81E+06	7,37E+07	4,83E+07	1,73E-03	13906,1	13143,1
13	1,25E+04	1,25E+04	5,58E+07	2,34E+07	8,65E+06	1,97E+08	2,15E+07	8,93E+05	1,95E+06	2,28E+07	3,28E+07	7,56E-04	14845,4	15299,2

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,96E+02	7,96E+02	2,16E+05	4,48E+10	4,79E+04	3,62E+11	2,66E+13	7,02E+12	7,77E+06	1,00E+00	1,00E+00	1,27E+00	275,0	271,1
2	9,06E+02	9,06E+02	2,55E+05	1,89E+10	8,50E+04	5,00E+11	9,16E+12	8,23E+12	4,08E+07	1,00E+00	2,35E+00	5,76E-01	352,5	349,4
3	1,04E+03	1,04E+03	2,32E+05	2,36E+09	6,42E+04	3,07E+11	2,40E+12	4,95E+11	6,38E+08	1,00E+00	2,07E+01	2,39E-01	584,7	537,1
4	1,39E+03	1,39E+03	2,75E+05	2,86E+05	5,79E+04	1,17E+11	5,61E+11	9,20E+10	5,72E+09	1,00E+00	1,15E+02	9,99E-02	1021,0	935,8
5	1,14E+03	1,14E+03	3,10E+05	1,41E+07	9,15E+04	7,64E+10	3,20E+11	4,77E+10	2,49E+09	1,00E+00	4,35E+02	8,63E-02	1477,2	1401,4
6	1,37E+03	1,37E+03	5,68E+05	4,58E+07	2,34E+05	5,76E+10	1,88E+11	2,32E+10	1,72E+09	1,00E+00	1,22E+03	8,00E-02	2147,2	2133,6
7	2,08E+03	2,08E+03	1,47E+06	8,81E+07	5,31E+05	3,47E+10	8,47E+10	7,37E+09	1,61E+09	2,40E+00	4,85E+03	5,54E-02	3196,5	3092,6
8	5,50E+03	5,50E+03	1,26E+07	2,04E+09	2,34E+08	1,83E+10	2,58E+10	8,32E+06	2,10E+08	1,94E+02	3,01E+03	4,32E-02	6126,8	6595,4
9	8,17E+03	8,17E+03	1,17E+07	5,38E+09	2,24E+08	5,26E+09	4,52E+09	1,00E+00	5,84E+08	2,96E+03	1,33E+04	1,83E-02	9416,1	8004,9
10	1,21E+04	1,21E+04	8,78E+08	2,15E+09	8,13E+08	1,52E+09	4,22E+07	1,00E+00	1,92E+06	7,16E+08	1,46E+08	1,03E-02	13318,6	11912,2
11	1,64E+04	1,64E+04	6,61E+08	3,91E+08	2,59E+08	5,57E+08	6,74E+06	1,00E+00	5,37E+05	4,62E+08	1,94E+08	5,70E-03	19060,5	16362,9
12	2,27E+04	2,27E+04	2,96E+08	1,11E+08	9,27E+07	2,99E+08	9,02E+06	1,00E+00	2,05E+06	1,65E+08	1,29E+08	3,64E-03	27213,6	24932,7
13	2,30E+04	2,30E+04	1,49E+08	3,76E+07	2,79E+07	2,58E+08	1,28E+07	3,71E+05	3,15E+06	5,76E+07	9,08E+07	2,59E-03	27816,8	30553,3

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,14E+03	1,14E+03	2,90E+05	2,75E+10	6,00E+04	5,56E+11	2,45E+13	6,35E+12	1,13E+09	1,00E+00	1,00E+00	1,96E+00	459,5	442,4
2	1,27E+03	1,27E+03	2,37E+05	9,32E+01	5,21E+04	4,81E+11	6,34E+12	1,47E+12	8,34E+09	1,00E+00	2,96E+00	6,80E-01	720,4	597,8
3	1,91E+03	1,91E+03	3,90E+05	3,04E+04	7,69E+04	3,16E+11	1,45E+12	2,25E+11	4,80E+10	1,00E+00	3,21E+01	3,87E-01	1453,2	1378,3
4	2,09E+03	2,09E+03	4,28E+05	2,23E+04	8,61E+04	1,58E+11	4,66E+11	4,29E+10	2,65E+10	1,00E+00	1,36E+02	2,07E-01	2719,4	2212,0
5	2,37E+03	2,37E+03	3,79E+05	4,04E+03	1,21E+05	6,55E+10	1,62E+11	9,56E+09	1,11E+10	1,00E+00	3,42E+02	9,16E-02	3348,5	2736,9
6	5,63E+03	5,63E+03	3,66E+06	1,05E+09	1,94E+06	4,22E+10	6,66E+10	1,00E+00	9,60E+08	3,39E+00	1,95E+02	7,80E-02	6473,8	5027,1
7	9,84E+03	9,84E+03	2,25E+09	3,97E+10	9,19E+09	1,04E+10	3,12E+05	1,00E+00	3,47E+04	1,54E+09	6,30E+08	7,27E-02	9559,7	8279,6
8	8,42E+03	8,42E+03	1,38E+10	1,01E+10	1,68E+09	3,54E+09	1,20E+00	1,00E+00	1,00E+00	1,02E+10	3,66E+09	5,02E-02	8850,0	8105,4
9	9,48E+03	9,48E+03	8,10E+09	3,14E+09	7,58E+08	1,82E+09	1,00E+00	1,00E+00	1,00E+00	5,86E+09	2,22E+09	2,69E-02	10106,2	8580,1
10	1,26E+04	1,26E+04	5,10E+09	4,94E+08	2,26E+08	5,19E+08	1,00E+00	1,00E+00	1,00E+00	3,56E+09	1,55E+09	1,78E-02	14453,8	11193,7
11	1,91E+04	1,91E+04	2,39E+09	1,33E+08	9,87E+07	2,76E+08	1,00E+00	1,00E+00	1,45E+01	1,48E+09	9,04E+08	1,32E-02	20719,1	18175,9
12	2,30E+04	2,30E+04	5,57E+08	3,48E+07	2,92E+07	1,30E+08	2,87E+05	1,00E+00	2,31E+04	2,86E+08	2,70E+08	5,67E-03	37418,6	37570,4
13	2,30E+04	2,30E+04	1,62E+08	2,09E+07	1,72E+07	1,38E+08	2,33E+06	4,61E+04	9,57E+05	5,98E+07	1,02E+08	2,60E-03	49377,9	45216,9

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 20,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,50E+03	1,50E+03	3,08E+05	1,50E+04	5,20E+04	8,43E+11	2,21E+13	5,56E+12	2,80E+10	1,00E+00	1,00E+00	2,85E+00	874,0	725,3
2	1,98E+03	1,98E+03	2,76E+05	3,89E+03	1,03E+04	5,26E+11	3,49E+12	6,61E+11	1,42E+11	1,00E+00	5,27E+00	7,72E-01	1430,0	1176,1
3	3,36E+03	3,36E+03	6,06E+06	1,01E+07	7,54E+06	3,67E+11	5,43E+11	1,00E+00	2,35E+08	1,00E+00	3,43E+01	4,73E-01	4606,6	3783,2
4	4,82E+03	4,82E+03	4,11E+07	4,85E+10	1,45E+08	1,62E+11	1,42E+11	1,00E+00	1,25E+00	2,14E+02	9,37E+01	2,37E-01	6051,9	4883,9
5	7,13E+03	7,13E+03	3,58E+09	1,28E+11	3,03E+10	3,69E+10	7,35E+01	1,00E+00	1,05E+00	4,54E+08	2,90E+09	1,64E-01	6983,4	5731,0
6	7,66E+03	7,66E+03	2,82E+10	3,99E+10	5,67E+09	6,30E+09	3,14E+00	1,00E+00	1,00E+00	1,69E+10	1,13E+10	1,06E-01	7737,6	6533,2
7	8,35E+03	8,35E+03	2,42E+10	1,45E+10	3,03E+09	3,06E+09	1,37E+00	1,00E+00	1,00E+00	1,70E+10	7,18E+09	7,36E-02	10035,3	7417,4
8	9,65E+03	9,65E+03	2,21E+10	6,22E+09	1,74E+09	1,80E+09	1,00E+00	1,00E+00	1,00E+00	1,61E+10	6,06E+09	6,71E-02	12373,1	9002,0
9	1,15E+04	1,15E+04	1,95E+10	2,25E+09	7,69E+08	9,39E+08	1,00E+00	1,00E+00	1,00E+00	1,40E+10	5,52E+09	6,66E-02	12074,4	10708,2
10	1,29E+04	1,29E+04	8,69E+09	3,15E+08	1,66E+08	2,73E+08	1,00E+00	1,00E+00	1,00E+00	5,89E+09	2,80E+09	2,82E-02	14907,5	10621,7
11	1,51E+04	1,51E+04	3,31E+09	3,17E+07	1,98E+07	4,47E+07	1,00E+00	1,00E+00	1,00E+00	1,97E+09	1,34E+09	1,05E-02	23693,3	13270,4
12	2,30E+04	2,30E+04	1,34E+09	1,90E+07	1,60E+07	6,34E+07	2,07E+03	1,00E+00	3,02E+01	6,37E+08	7,04E+08	1,73E-02	35628,0	50579,5
13	2,30E+04	2,30E+04	1,93E+08	1,66E+07	1,37E+07	1,15E+06	1,20E+06	2,08E+04	3,51E+05	6,93E+07	1,23E+08	3,26E-03	54096,6	55965,7

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 60,0

KCYC= 12 TIMDEL= 2,000000E-03 TIMTOT= 4,900000E-02 TTX= 1,112000E+01 DSMALL= 1,093557E+01

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,354459E+06	1,710093E-09	2,831234E+02	2,962589E+23	1,271601E+09	1,087278E+00	0,	9,708917E+06	5,662469E+02
2	1,002237E+07	5,177025E-10	4,706490E+02	2,625309E+23	1,378237E+09	3,567564E-01	4,003815E-05	1,033583E+07	3,750511E+02
3	1,068308E+07	1,792875E-10	1,445938E+03	2,914278E+23	1,577820E+09	1,414417E-01	0,	1,103033E+07	2,516826E+03
4	1,144782E+07	5,812525E-11	4,672418E+03	3,512028E+23	2,027255E+09	5,891734E-02	0,	1,186531E+07	6,626011E+03
5	1,234724E+07	1,885006E-11	7,140023E+03	4,065631E+23	2,946732E+09	2,777304E-02	0,	1,282922E+07	7,452036E+03
6	1,337343E+07	7,602860E-12	8,352898E+03	4,605227E+23	4,027731E+09	1,531114E-02	0,	1,391763E+07	9,253761E+03
7	1,459884E+07	3,784057E-12	1,339712E+04	5,786326E+23	5,177613E+09	9,796191E-03	0,	1,528004E+07	1,754047E+04
8	1,599979E+07	1,918814E-12	1,651802E+04	6,140028E+23	7,002053E+09	6,717820E-03	1,029295E-04	1,671954E+07	1,549557E+04
9	1,785378E+07	8,224709E-13	1,249689E+04	9,730936E+23	8,977032E+09	3,691674E-03	1,000420E-04	1,898801E+07	9,496206E+03
10	2,095324E+07	2,442157E-13	1,016772E+04	1,702024E+24	1,336063E+10	1,631438E-03	0,	2,291846E+07	1,083724E+04
11	2,562432E+07	8,780010E-14	1,925645E+04	2,376858E+24	2,114230E+10	9,281479E-04	0,	2,833018E+07	2,767565E+04
12	3,271623E+07	2,234995E-14	5,070473E+04	3,935690E+24	3,567407E+10	3,986568E-04	0,	3,710227E+07	7,373362E+04
13	4,261943E+07	6,738458E-15	9,272324E+04	5,098174E+24	5,628567E+10	1,896393E-04	0,	4,813660E+07	1,117127E+05

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 60,0

KCYC= 13 TIMDEL= 2,000000E-03 TIMTOT= 5,100000E-02 TTX= 1,112900E+01 DSMALL= 7,769430E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,361628E+06	1,676153E-09	5,171822E+02	3,022579E+23	1,288572E+09	1,079922E+00	0,	9,723256E+06	1,034364E+03
2	1,004496E+07	5,044032E-10	8,409771E+02	2,694529E+23	1,466795E+09	3,699280E-01	2,042352E-03	1,036665E+07	6,475898E+02
3	1,073887E+07	1,672331E-10	3,527541E+03	3,124343E+23	1,590328E+09	1,329778E-01	0,	1,111109E+07	6,407493E+03
4	1,157941E+07	5,179499E-11	8,888719E+03	3,941260E+23	2,310088E+09	5,982549E-02	0,	1,204773E+07	1,136995E+04
5	1,260406E+07	1,631722E-11	1,174753E+04	4,696718E+23	3,529876E+09	2,879888E-02	0,	1,316039E+07	1,212511E+04
6	1,375577E+07	6,941231E-12	1,521812E+04	5,044191E+23	4,458047E+09	1,547217E-02	0,	1,435115E+07	1,831113E+04
7	1,500435E+07	3,941351E-12	2,238216E+04	5,555401E+23	6,172280E+09	1,216356E-02	0,	1,565756E+07	2,645318E+04
8	1,626795E+07	2,260731E-12	2,481819E+04	5,211401E+23	8,904065E+09	1,006485E-02	2,843724E-04	1,687834E+07	2,318320E+04
9	1,783254E+07	9,777222E-13	2,318214E+04	8,185772E+23	1,150181E+10	5,622785E-03	3,421838E-05	1,878673E+07	2,316109E+04
10	2,120189E+07	1,985686E-13	2,563793E+04	2,093286E+24	2,194087E+10	2,178384E-03	0,	2,361706E+07	2,609478E+04
11	2,708470E+07	6,821067E-14	6,470799E+04	3,059468E+24	3,752933E+10	1,279950E-03	0,	3,055234E+07	1,013212E+05
12	3,579579E+07	1,852448E-14	1,394554E+05	4,748445E+24	6,302767E+10	5,837774E-04	0,	4,103924E+07	1,775896E+05
13	4,625941E+07	7,046180E-15	2,016261E+05	4,875525E+24	9,126678E+10	3,215411E-04	0,	5,147958E+07	2,256625E+05

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 60,0

KCYC= 16 TIMDEL= 3,000000E-03 TIMTOT= 5,400000E-02 TTX= 1,114000E+01 DSMALL= 3,539196E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,373333E+06	1,623543E-09	6,154850E+02	3,120523E+23	1,340906E+09	1,088509E+00	0,	9,746666E+06	1,230970E+03
2	1,008897E+07	4,739816E-10	2,740808E+03	2,867472E+23	1,574902E+09	3,732372E-01	0,	1,043127E+07	4,250646E+03
3	1,087388E+07	1,405743E-10	8,273232E+03	3,716851E+23	1,774838E+09	1,247483E-01	0,	1,131650E+07	1,229582E+04
4	1,191987E+07	4,015987E-11	1,534033E+04	5,083122E+23	3,016839E+09	6,057792E-02	0,	1,252325E+07	1,838483E+04
5	1,318060E+07	1,378094E-11	2,172670E+04	5,561114E+23	4,630862E+09	3,190882E-02	0,	1,383835E+07	2,506857E+04
6	1,440582E+07	7,268030E-12	2,436170E+04	4,817385E+23	5,821355E+09	2,115489E-02	2,873163E-05	1,497329E+07	2,365484E+04
7	1,551812E+07	4,717930E-12	2,838609E+04	4,640973E+23	9,226746E+09	2,176557E-02	0,	1,606295E+07	3,311734E+04
8	1,675161E+07	2,000839E-12	5,631871E+04	5,888318E+23	1,333373E+10	1,333932E-02	0,	1,744027E+07	7,952007E+04
9	1,851357E+07	8,674110E-13	8,280517E+04	9,226781E+23	1,864090E+10	8,084659E-03	0,	1,958688E+07	8,609028E+04
10	2,298852E+07	1,402207E-13	1,000378E+05	2,964332E+24	5,028817E+10	3,525722E-03	0,	2,639016E+07	1,139854E+05
11	3,235873E+07	3,900670E-14	1,954440E+05	5,350065E+24	8,025128E+10	1,565169E-03	0,	3,832729E+07	2,769027E+05
12	4,443496E+07	1,550258E-14	3,442306E+05	5,674055E+24	1,268162E+11	9,829887E-04	0,	5,054263E+07	4,115566E+05
13	5,529656E+07	7,536613E-15	4,732948E+05	4,558258E+24	1,662447E+11	6,264610E-04	0,	6,005048E+07	5,350310E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 60.0

KCYC= 25 TTMDEL= 5.000000E-03 TIMTOT= 5.900000E-02 TTX= 1.115300E+01 DSMALL= 3.967899E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9.404989E+06	1.496492E-09	1.536657E+03	3.385454E+23	1.510206E+09	1.130005E+00	0.	9.809978E+06	3.073313E+03
2	1.024391E+07	3.737119E-10	6.488967E+03	3.630836E+23	1.674292E+09	3.128513E-01	0.	1.067785E+07	1.390462E+04
3	1.130162E+07	9.961758E-11	1.868832E+04	5.244995E+23	2.686830E+09	1.338278E-01	0.	1.192539E+07	2.345203E+04
4	1.272129E+07	3.037008E-11	2.680089E+04	6.721665E+23	5.492048E+09	8.339696E-02	0.	1.351719E+07	3.016975E+04
5	1.429665E+07	1.155316E-11	4.386838E+04	6.633453E+23	6.715976E+09	3.879539E-02	0.	1.508050E+07	5.756701E+04
6	1.570715E+07	6.555539E-12	6.495773E+04	5.340964E+23	1.014735E+10	3.326067E-02	0.	1.633379E+07	7.234846E+04
7	1.740013E+07	2.596715E-12	1.038098E+05	9.135750E+23	1.336980E+10	1.604576E-02	0.	1.846646E+07	1.352712E+05
8	2.025033E+07	7.642161E-13	1.781108E+05	1.541655E+24	3.169373E+10	1.211043E-02	0.	2.203420E+07	2.209504E+05
9	2.471855E+07	3.403489E-13	2.510308E+05	2.351531E+24	6.407402E+10	1.090376E-02	0.	2.740291E+07	2.611112E+05
10	3.341191E+07	7.592770E-14	3.566217E+05	5.403266E+24	1.239278E+11	4.766742E-03	0.	3.942090E+07	4.321322E+05
11	4.626837E+07	2.510596E-14	5.441059E+05	8.312306E+24	1.849773E+11	2.322016E-03	0.	5.711585E+07	6.560795E+05
12	6.485507E+07	1.155278E-14	8.016822E+05	7.627170E+24	2.687832E+11	1.549909E-03	0.	7.259429E+07	9.472850E+05
13	7.975792E+07	4.679166E-15	1.149040E+06	7.341871E+24	2.292047E+11	5.362435E-04	0.	8.688159E+07	1.550894E+06

FOR COLUMN 5 REZONE NUMBER 1 REQUIRED AT TIME 6.000000E+01

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 60.0

KCYC= 31 TTMDEL= 5.000000E-03 TIMTOT= 6.400000E-02 TTX= 1.116500E+01 DSMALL= 3.678379E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9.650364E+06	9.198369E-10	1.018523E+04	5.507829E+23	2.045597E+09	9.408077E-01	0.	1.031673E+07	2.037045E+04
2	1.100778E+07	2.541119E-10	2.486369E+04	5.605468E+23	2.703669E+09	3.164805E-01	0.	1.169864E+07	2.935692E+04
3	1.289153E+07	5.184505E-11	5.623519E+04	1.007799E+24	6.551280E+09	1.690257E-01	0.	1.408422E+07	6.311345E+04
4	1.594140E+07	1.288715E-11	1.085472E+05	1.584039E+24	9.340494E+09	6.018619E-02	0.	1.779857E+07	1.339809E+05
5	1.920865E+07	6.307975E-12	1.599329E+05	1.214928E+24	1.432973E+10	4.519578E-02	0.	2.061912E+07	1.858649E+05
6	2.263529E+07	1.991960E-12	2.095682E+05	1.757711E+24	2.586636E+10	2.576238E-02	0.	2.465746E+07	2.332514E+05
7	2.663818E+07	6.205218E-13	3.152643E+05	3.528608E+24	6.127202E+10	1.901031E-02	0.	3.261809E+07	3.972773E+05
8	3.658861E+07	3.269568E-13	4.871164E+05	3.603404E+24	9.576711E+10	1.565565E-02	0.	4.055833E+07	5.769555E+05
9	4.507146E+07	1.905345E-13	6.534816E+05	4.200506E+24	1.242756E+11	1.183939E-02	0.	4.958460E+07	7.300077E+05
10	5.605046E+07	6.698822E-14	8.232995E+05	6.213331E+24	1.468943E+11	4.913485E-03	0.	6.251633E+07	9.165912E+05
11	7.028342E+07	2.684619E-14	1.057643E+06	7.773482E+24	2.171691E+11	2.915061E-03	0.	7.605051E+07	1.196695E+06
12	8.612031E+07	1.041947E-14	1.473652E+06	8.442128E+24	4.353324E+11	2.267966E-03	0.	9.419011E+07	1.746609E+06
13	1.009856E+08	4.639766E-15	1.800709E+06	7.404184E+24	4.171945E+11	9.678466E-04	0.	1.077811E+08	1.852809E+06

FOR COLUMN 6 REZONE NUMBER 1 REQUIRED AT TIME 6.000000E+01

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 60.0

KCYC= 50 TTMDEL= 1.000000E-02 TIMTOT= 7.400000E-02 TTX= 1.116200E+01 DSMALL= 2.439495E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	1.018961E+07	5.082303E-10	2.321157E+04	9.968520E+23	2.534059E+09	6.439428E-01	0.	1.137921E+07	4.642314E+04
2	1.264400E+07	1.272707E-10	6.599206E+04	3.067904E+24	5.528929E+09	3.518354E-01	0.	1.390878E+07	8.556098E+04
3	1.812762E+07	1.942271E-11	1.607461E+05	3.622716E+24	2.072528E+10	1.494573E-01	0.	2.234666E+07	2.359311E+05
4	2.729502E+07	4.672923E-12	3.190804E+05	4.366518E+24	3.412150E+10	7.972356E-02	0.	3.224317E+07	4.022297E+05
5	3.633617E+07	2.064291E-12	4.765601E+05	3.712528E+24	4.576044E+10	4.723144E-02	0.	4.042917E+07	5.508905E+05
6	4.450466E+07	9.245868E-13	6.294962E+05	3.786869E+24	7.798940E+10	3.605399E-02	0.	4.858015E+07	7.091020E+05
7	5.319681E+07	4.976508E-13	7.882633E+05	4.399829E+24	9.186763E+10	2.285900E-02	0.	5.781347E+07	8.674247E+05
8	6.251906E+07	2.557140E-13	9.674167E+05	4.607326E+24	9.770248E+10	1.249194E-02	0.	6.722625E+07	1.067409E+06
9	7.339141E+07	1.285706E-13	1.218980E+06	6.224481E+24	1.059500E+11	6.811505E-03	0.	7.955658E+07	1.370552E+06
10	8.436415E+07	8.305136E-14	1.474801E+06	5.004865E+24	1.443972E+11	5.996193E-03	0.	8.917173E+07	1.579050E+06
11	9.252960E+07	5.837095E-14	1.675083E+06	3.575210E+24	2.078634E+11	6.066591E-03	0.	9.588747E+07	1.771116E+06
12	1.046916E+08	8.871658E-15	1.940016E+06	9.914999E+24	4.504086E+11	1.997935E-03	0.	1.138958E+08	2.108917E+06
13	1.239817E+08	2.939966E-15	2.602608E+06	1.168511E+25	4.097399E+11	6.023108E-04	0.	1.340676E+08	3.096299E+06

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 30.00 TDAT2 = 60.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	4.38E+02	4.38E+02	6.26E+04	7.86E+08	3.40E+04	3.36E+11	2.81E+13	7.43E+12	2.72E+08	1.00E+00	1.00E+00	1.04E+00	221.1	219.6
2	5.56E+02	5.56E+02	1.60E+05	8.19E+08	7.45E+04	4.34E+11	8.50E+12	2.08E+12	2.07E+08	1.00E+00	1.88E+00	3.56E-01	236.5	234.5
3	6.03E+02	6.03E+02	1.73E+05	4.62E+08	8.40E+04	3.20E+11	2.94E+12	6.36E+11	3.00E+08	1.00E+00	1.50E+01	1.42E-01	270.7	262.6
4	6.34E+02	6.34E+02	1.74E+05	2.79E+08	8.27E+04	1.45E+11	9.54E+11	1.86E+11	2.78E+08	1.00E+00	7.58E+01	5.92E-02	350.0	332.3
5	7.40E+02	7.40E+02	1.67E+05	2.19E+08	7.31E+04	5.31E+10	3.09E+11	5.72E+10	2.52E+08	1.00E+00	2.48E+02	2.80E-02	499.5	474.2
6	7.95E+02	7.95E+02	1.56E+05	1.46E+08	7.86E+04	2.79E+10	1.24E+11	2.07E+10	1.92E+08	1.00E+00	7.93E+02	1.54E-02	679.2	643.2
7	6.92E+02	6.92E+02	1.67E+05	5.73E+07	9.29E+04	1.75E+10	6.07E+10	9.26E+09	7.79E+07	1.00E+00	2.92E+03	4.82E-03	848.1	810.7
8	7.79E+02	7.79E+02	4.03E+05	5.13E+07	2.77E+06	1.13E+10	3.00E+10	4.14E+09	5.35E+07	2.45E+00	1.33E+05	6.76E-03	1025.8	1066.1
9	9.32E+02	9.32E+02	2.13E+06	3.92E+07	8.66E+06	6.55E+09	1.23E+10	1.51E+09	2.94E+07	1.72E+01	1.85E+06	3.73E-03	1263.9	1322.2
10	1.78E+03	1.78E+03	7.06E+06	6.29E+07	2.09E+07	2.62E+09	3.33E+09	3.19E+08	1.86E+07	4.11E+02	6.70E+06	1.66E-03	1898.4	1851.4
11	2.75E+03	2.75E+03	1.13E+07	5.16E+07	1.55E+07	1.32E+09	1.02E+09	6.56E+07	4.80E+06	1.40E+06	8.73E+06	9.63E-04	2756.0	2692.4
12	4.60E+03	4.60E+03	2.31E+07	2.86E+07	5.52E+06	4.53E+08	1.84E+08	7.23E+06	8.03E+05	1.24E+07	1.05E+07	4.15E-04	4298.1	3471.4
13	5.32E+03	5.32E+03	1.45E+07	6.75E+06	1.91E+06	1.72E+08	3.19E+07	1.46E+06	2.28E+05	5.87E+06	8.53E+06	1.91E-04	5852.8	5600.7

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 30.00 TDAT2 = 60.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	4.92E+02	4.92E+02	6.42E+04	2.11E+09	3.64E+04	3.36E+11	2.75E+13	7.28E+12	3.84E+07	1.00E+00	1.00E+00	1.06E+00	226.2	222.6
2	6.46E+02	6.46E+02	1.71E+05	2.43E+09	7.46E+04	4.28E+11	8.28E+12	2.03E+12	2.54E+07	1.00E+00	2.00E+00	3.70E-01	250.1	249.5
3	6.32E+02	6.32E+02	1.61E+05	5.20E+08	7.39E+04	3.01E+11	2.75E+12	5.92E+11	2.65E+08	1.00E+00	1.45E+01	1.34E-01	290.8	265.2
4	7.41E+02	7.41E+02	1.72E+05	3.83E+08	7.00E+04	1.33E+11	8.50E+11	1.64E+11	3.06E+08	1.00E+00	8.06E+01	6.04E-02	406.5	376.1
5	8.92E+02	8.92E+02	1.67E+05	2.84E+08	7.21E+04	4.83E+10	2.68E+11	4.84E+10	3.77E+08	1.00E+00	2.67E+02	2.92E-02	604.3	572.2
6	8.43E+02	8.43E+02	1.39E+05	1.45E+08	6.62E+04	2.64E+10	1.13E+11	1.84E+10	2.51E+08	1.00E+00	7.87E+02	1.56E-02	804.8	711.9
7	8.20E+02	8.20E+02	1.92E+05	9.61E+07	1.19E+05	1.89E+10	6.31E+10	9.33E+09	1.36E+08	1.00E+00	3.36E+03	1.22E-02	998.2	963.0
8	9.77E+02	9.77E+02	6.41E+05	1.03E+08	5.83E+06	1.37E+10	3.53E+10	4.66E+09	9.74E+07	5.02E+00	2.03E+05	1.02E-02	1210.2	1353.0
9	1.22E+03	1.22E+03	3.50E+06	9.61E+07	1.77E+07	7.71E+09	1.46E+10	1.69E+09	6.04E+07	3.94E+01	3.03E+06	5.73E-03	1557.1	1065.6
10	3.33E+03	3.33E+03	6.36E+06	1.59E+08	3.86E+07	2.35E+09	2.62E+09	1.54E+08	3.59E+07	9.83E+03	5.57E+06	2.25E-03	3175.2	2443.6
11	5.38E+03	5.38E+03	2.71E+07	1.45E+08	1.91E+07	1.11E+09	7.21E+08	1.25E+07	3.89E+06	1.71E+07	9.39E+06	1.35E-03	5102.0	4499.2
12	6.79E+03	6.79E+03	4.22E+07	6.83E+07	1.04E+07	3.75E+08	1.20E+08	1.64E+06	2.94E+06	2.55E+07	1.65E+07	6.05E-04	7312.5	6425.7
13	7.39E+03	7.39E+03	2.55E+07	1.41E+07	3.33E+06	1.74E+08	2.67E+07	1.02E+06	1.01E+06	1.04E+07	1.50E+07	3.24E-04	6923.2	6614.9

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 30.00 TDAT2 = 60.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	5.84E+02	5.84E+02	8.08E+04	9.29E+09	4.03E+04	3.36E+11	2.67E+13	7.04E+12	1.03E+06	1.00E+00	1.00E+00	1.09E+00	237.4	251.5
2	7.48E+02	7.48E+02	1.73E+05	6.38E+09	7.35E+04	4.09E+11	7.78E+12	1.90E+12	2.17E+06	1.00E+00	2.03E+00	3.73E-01	276.7	267.7
3	7.49E+02	7.49E+02	1.44E+05	1.07E+09	5.45E+04	2.60E+11	2.31E+12	4.94E+11	1.02E+08	1.00E+00	1.46E+01	1.25E-01	351.1	290.2
4	9.36E+02	9.36E+02	1.61E+05	4.42E+08	6.03E+04	1.11E+11	6.59E+11	1.23E+11	4.01E+08	1.00E+00	9.01E+01	6.13E-02	543.5	491.7
5	1.05E+03	1.05E+03	1.53E+05	1.21E+08	6.90E+04	4.50E+10	2.26E+11	3.87E+10	7.79E+08	1.00E+00	2.94E+02	3.24E-02	821.6	745.6
6	9.00E+02	9.00E+02	1.44E+05	9.05E+07	7.73E+04	2.96E+10	1.18E+11	1.82E+10	4.16E+08	1.0[illegible]E+00	8.95E+02	2.14E-02	1062.5	924.3
7	1.09E+03	1.09E+03	3.03E+05	1.21E+08	3.43E+05	2.43E+10	7.54E+10	1.02E+10	3.50E+08	1.38E+00	3.69E+03	2.20E-02	1409.8	1427.5
8	1.56E+03	1.56E+03	9.17E+05	1.37E+08	5.89E+06	1.36E+10	3.11E+10	3.37E+09	2.63E+08	1.19E+01	1.36E+05	1.37E-02	1947.7	2006.4
9	2.23E+03	2.23E+03	2.29E+06	1.66E+08	1.49E+07	7.72E+09	1.28E+10	9.97E+08	2.38E+08	1.13E+02	1.01E+06	8.56E-03	2987.7	2682.8
10	7.25E+03	7.25E+03	1.24E+07	8.14E+08	8.52E+07	1.95E+09	1.52E+09	1.00E+00	1.12E+07	9.44E+06	7.70E+05	3.69E-03	6574.6	5840.1
11	7.96E+03	7.96E+03	4.22E+07	4.98E+08	9.06E+07	6.35E+08	1.89E+08	1.00E+00	1.48E+07	3.24E+07	6.35E+06	1.65E-03	10083.7	7725.2
12	9.86E+03	9.86E+03	7.27E+07	1.41E+08	4.03E+07	2.96E+08	3.85E+07	1.00E+00	5.32E+06	4.34E+07	2.86E+07	1.01E-03	13284.6	11007.5
13	1.12E+04	1.12E+04	4.61E+07	2.81E+07	9.43E+06	1.75E+08	1.51E+07	4.20E+05	2.84E+06	1.85E+07	2.73E+07	6.32E-04	15402.2	14456.7

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,60E+02	7,60E+02	1,01E+05	4,10E+10	4,62E+04	3,35E+11	2,44E+13	6,46E+12	5,37E+06	1,00E+00	1,00E+00	1,13E+00	271,1	260,6
2	8,93E+02	8,93E+02	1,31E+05	1,22E+10	5,31E+04	3,35E+11	6,13E+12	1,49E+12	1,78E+07	1,00E+00	1,81E+00	3,14E-01	349,8	285,5
3	1,04E+03	1,04E+03	1,27E+05	8,75E+08	4,79E+04	2,10E+11	1,64E+12	3,37E+11	3,06E+08	1,00E+00	1,78E+01	1,35E-01	540,4	445,4
4	1,39E+03	1,39E+03	1,75E+05	7,47E+03	7,12E+04	1,04E+11	4,97E+11	8,16E+10	5,72E+09	1,00E+00	1,17E+02	8,34E-02	932,6	676,2
5	1,14E+03	1,14E+03	1,08E+05	1,26E+02	4,34E+04	4,52E+10	1,89E+11	2,82E+10	2,49E+09	1,00E+00	3,33E+02	3,88E-02	1401,5	1073,5
6	1,37E+03	1,37E+03	1,30E+05	2,14E+02	4,75E+04	3,25E+10	1,06E+11	1,31E+10	1,73E+09	1,00E+00	8,55E+02	3,33E-02	2139,6	1597,0
7	2,08E+03	2,08E+03	1,87E+05	1,01E+00	1,00E+00	1,56E+10	3,80E+10	3,27E+09	1,61E+09	1,00E+00	1,60E+03	1,62E-02	3122,3	2065,8
8	5,51E+03	5,51E+03	3,77E+06	7,61E+08	6,25E+07	8,19E+09	1,14E+10	1,00E+00	5,61E+07	1,15E+02	1,63E+03	1,26E-02	6712,2	4393,3
9	8,10E+03	8,10E+03	6,34E+06	3,62E+09	7,01E+07	4,02E+09	3,49E+09	1,00E+00	2,98E+08	3,64E+03	4,28E+03	1,16E-02	8298,4	6481,4
10	9,32E+03	9,32E+03	5,06E+08	1,38E+09	4,78E+08	9,20E+08	6,31E+06	1,00E+00	3,62E+05	4,08E+08	9,06E+07	4,82E-03	11766,6	9115,4
11	1,28E+04	1,28E+04	3,01E+08	2,45E+08	1,30E+08	3,10E+08	4,46E+05	1,00E+00	7,49E+04	2,51E+08	1,08E+08	2,33E-03	16216,7	12024,3
12	1,71E+04	1,71E+04	1,65E+08	7,05E+07	5,82E+07	1,72E+08	1,78E+06	1,00E+00	5,69E+05	9,11E+07	7,23E+07	1,56E-03	24253,4	18244,0
13	1,56E+04	1,56E+04	5,18E+07	1,75E+07	1,42E+07	9,34E+07	1,97E+06	1,43E+04	2,56E+06	1,96E+07	3,21E+07	5,34E-04	31256,1	18487,3

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,09E+03	1,09E+03	9,33E+04	5,87E+09	2,57E+04	3,54E+11	1,51E+13	3,91E+12	4,92E+08	1,00E+00	1,00E+00	9,62E-01	452,8	354,3
2	1,25E+03	1,25E+03	9,71E+04	4,38E+04	4,06E+04	2,91E+11	3,84E+12	8,93E+11	8,34E+09	1,00E+00	2,61E+00	3,16E-01	593,0	454,6
3	1,91E+03	1,91E+03	1,51E+05	1,49E+04	2,89E+04	1,84E+11	8,45E+11	1,32E+11	4,80E+10	1,00E+00	2,49E+01	1,70E-01	1374,2	1044,5
4	2,09E+03	2,09E+03	1,11E+05	7,84E+03	1,00E+00	7,07E+10	2,09E+11	1,92E+10	2,65E+10	1,00E+00	1,05E+02	6,02E-02	2163,0	1432,7
5	2,37E+03	2,37E+03	1,52E+05	3,53E+04	1,50E+03	4,12E+10	1,02E+11	6,01E+09	1,11E+10	1,00E+00	3,26E+02	4,52E-02	2670,0	2109,7
6	5,63E+03	5,63E+03	5,34E+05	7,60E+07	4,71E+04	2,09E+10	3,29E+10	1,00E+00	5,21E+08	3,76E+00	1,56E+02	2,69E-02	5095,7	3522,7
7	5,92E+03	5,92E+03	8,79E+08	1,69E+10	3,74E+09	4,27E+09	1,82E+04	1,00E+00	1,19E+02	5,19E+08	3,32E+08	1,92E-02	6208,3	5244,0
8	6,75E+03	6,75E+03	5,87E+09	5,53E+09	6,55E+08	1,60E+09	1,51E+00	1,00E+00	1,00E+00	4,09E+09	1,78E+09	1,59E-02	6483,6	5751,4
9	7,66E+03	7,66E+03	4,47E+09	2,19E+09	3,67E+08	1,03E+09	1,07E+00	1,00E+00	1,00E+00	3,13E+09	1,33E+09	1,19E-02	6575,5	6519,5
10	8,77E+03	8,77E+03	2,16E+09	2,70E+08	8,84E+07	2,32E+08	1,00E+00	1,00E+00	1,00E+00	1,50E+09	6,64E+08	4,93E-03	10249,7	6671,0
11	1,33E+04	1,33E+04	8,93E+08	5,62E+07	3,74E+07	1,05E+08	1,03E+00	1,00E+00	1,00E+00	5,53E+08	3,40E+08	2,92E-03	17325,8	10465,0
12	2,30E+04	2,30E+04	3,08E+08	1,96E+07	1,06E+07	7,21E+07	1,00E+00	1,00E+00	3,81E+03	1,56E+08	1,50E+08	2,27E-03	37644,6	27731,4
13	2,30E+04	2,30E+04	8,45E+07	1,24E+07	1,03E+07	7,26E+07	5,01E+05	1,08E+03	5,77E+05	3,08E+07	5,33E+07	9,70E-04	44065,9	31733,0

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,45E+03	1,45E+03	6,68E+04	7,75E+00	2,84E+03	3,18E+11	6,34E+12	2,09E+12	2,80E+10	1,00E+00	1,00E+00	6,44E-01	721,9	439,6
2	1,97E+03	1,97E+03	1,09E+05	2,28E+04	4,02E+04	3,12E+11	2,08E+12	3,93E+11	1,42E+11	1,00E+00	4,69E+00	3,52E-01	1159,7	892,4
3	3,36E+03	3,36E+03	1,31E+06	4,51E+06	1,13E+06	1,72E+11	2,54E+11	1,00E+00	2,31E+08	1,00E+00	2,37E+01	1,49E-01	3766,3	2564,5
4	4,82E+03	4,82E+03	1,09E+07	2,37E+10	7,95E+07	7,91E+10	6,94E+10	1,00E+00	1,00E+00	2,59E+02	7,32E+01	7,97E-02	4858,2	3376,7
5	7,95E+03	7,95E+03	1,46E+09	5,80E+10	1,21E+10	1,63E+10	8,77E+01	1,00E+00	1,00E+00	9,21E+07	1,30E+09	4,84E-02	5825,0	3649,9
6	5,86E+03	5,86E+03	1,15E+10	2,20E+10	2,42E+09	3,54E+09	5,17E+00	1,00E+00	1,00E+00	6,34E+09	5,11E+09	3,66E-02	6840,7	4782,1
7	6,65E+03	6,65E+03	9,58E+09	8,49E+09	9,63E+08	1,67E+09	1,69E+00	1,00E+00	1,00E+00	6,49E+09	3,08E+09	2,32E-02	7396,0	5006,5
8	6,47E+03	6,47E+03	6,61E+09	2,80E+09	4,92E+08	7,19E+08	1,12E+00	1,00E+00	1,00E+00	4,71E+09	1,90E+09	1,26E-02	8525,6	4664,2
9	6,94E+03	6,94E+03	4,12E+09	7,24E+08	1,96E+08	2,81E+08	1,00E+00	1,00E+00	1,00E+00	2,93E+09	1,18E+09	6,84E-03	11032,5	5154,1
10	8,38E+03	8,38E+03	3,03E+09	1,82E+08	6,34E+07	1,33E+08	1,00E+00	1,00E+00	1,00E+00	2,06E+09	9,78E+08	6,00E-03	9768,0	5627,5
11	1,03E+04	1,03E+04	2,27E+09	3,63E+07	1,68E+07	4,45E+07	1,00E+00	1,00E+00	1,00E+00	1,35E+09	9,22E+08	6,07E-03	7747,6	6446,2
12	2,30E+04	2,30E+04	3,29E+08	5,06E+06	4,24E+06	1,60E+07	1,00E+00	1,00E+00	3,74E+00	1,56E+08	1,73E+08	2,00E-03	65663,5	31965,0
13	2,30E+04	2,30E+04	6,46E+07	6,03E+06	5,04E+06	3,86E+07	1,54E+05	4,40E+02	2,11E+05	2,31E+07	4,14E+07	6,03E-04	56465,1	32156,6

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 60,00

COLUMN (5, 1) = 5

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	O	N2
	O2	END	ENP	OP	P	Q	T N2V18	CO2		GAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,500E+06	9,198E-10	1,092E+03	9,334E+04	7,735E+03	1,547E+04	5,873E+09	2,573E+04	3,540E+11	1,510E+13
	3,909E+12	4,923E+08	1,000E+00	1,000E+00	9,618E-01	0,	1,092E+03	6,168E+09	IIII	2,450E+02
	9,532E+06	8,914E+08	9,334E+04	3,595E+02						
K = 2	1,075E+07	3,786E-10	1,174E+03	9,633E+04	2,177E+04	2,806E+04	1,238E+09	3,743E+04	3,045E+11	6,215E+12
	1,528E+12	6,683E+09	1,000E+00	2,269E+00	3,914E-01	0,	1,174E+03	2,537E+09	IIII	2,036E+03
	1,021E+07	3,667E+08	9,633E+04	3,517E+02						
K = 3	1,250E+07	6,992E-11	1,707E+03	1,278E+05	4,901E+04	6,995E+04	1,775E+04	3,009E+04	1,950E+11	1,142E+12
	2,070E+11	4,405E+10	1,000E+00	2,268E+01	1,933E-01	0,	1,707E+03	4,128E+08	IIII	1,882E+03
	1,079E+07	6,723E+07	1,277E+05	8,812E+02						
K = 4	1,475E+07	2,196E-11	1,990E+03	1,153E+05	8,965E+04	1,093E+05	9,481E+03	6,744E+03	9,721E+10	3,573E+11
	4,540E+10	3,151E+10	1,000E+00	8,660E+01	9,026E-02	0,	1,990E+03	1,064E+08	IIII	1,498E+03
	1,134E+07	2,100E+07	1,152E+05	1,230E+03						
K = 5	1,750E+07	1,025E-11	2,161E+03	1,270E+05	1,327E+05	1,561E+05	1,886E+04	6,037E+02	5,886E+10	1,661E+11
	1,392E+10	2,034E+10	1,000E+00	1,938E+02	5,250E-02	0,	2,161E+03	3,647E+07	IIII	1,511E+03
	1,204E+07	9,989E+06	1,268E+05	1,467E+03						
K = 6	2,075E+07	3,983E-12	3,306E+03	3,574E+05	1,820E+05	2,079E+05	4,096E+07	2,608E+04	3,028E+10	6,475E+10
	2,771E+09	5,423E+09	2,489E+00	2,343E+02	3,580E-02	0,	3,306E+03	7,702E+06	IIII	1,368E+03
	1,292E+07	5,041E+06	3,571E+05	2,511E+03						
K = 7	2,450E+07	1,358E-12	5,616E+03	4,063E+08	2,396E+05	2,712E+05	7,832E+09	1,727E+09	1,324E+10	1,768E+10
	1,000E+00	2,800E+08	2,397E+08	1,532E+08	2,424E-02	0,	5,616E+03	1,684E+06	IIII	9,879E+02
	1,370E+07	2,610E+06	1,340E+07	4,209E+03						
K = 8	2,900E+07	6,205E-13	5,915E+03	8,786E+08	3,227E+05	3,742E+05	1,686E+10	3,738E+09	4,275E+09	1,824E+04
	1,000E+00	1,191E+02	5,187E+08	3,315E+08	1,904E-02	0,	5,915E+03	3,717E+05	IIII	8,482E+02
	1,452E+07	1,299E+06	2,837E+07	5,155E+03						
K = 9	3,450E+07	3,813E-13	6,706E+03	4,945E+09	4,410E+05	5,077E+05	7,629E+09	1,226E+09	2,096E+09	3,379E+03
	1,000E+00	2,287E+01	3,426E+09	1,508E+09	1,671E-02	0,	6,706E+03	8,958E+04	IIII	1,153E+03
	1,568E+07	4,358E+05	1,117E+07	5,527E+03						
K =10	4,100E+07	2,498E-13	7,202E+03	5,076E+09	5,758E+05	6,438E+05	3,643E+09	4,921E+08	1,278E+09	1,266E+00
	1,000E+00	1,000E+00	3,548E+09	1,523E+09	1,370E-02	0,	7,202E+03	1,380E+04	IIII	1,768E+03
	1,744E+07	1,839E+05	5,721E+06	5,977E+03						
K =11	4,850E+07	1,451E-13	7,901E+03	3,620E+09	7,079E+05	7,721E+05	1,486E+09	2,644E+08	7,365E+08	1,047E+00
	1,000E+00	1,000E+00	2,532E+09	1,085E+09	9,057E-03	0,	7,901E+03	3,073E+03	IIII	2,315E+03
	1,971E+07	9,159E+04	3,071E+06	6,059E+03						
K =12	5,700E+07	6,690E-14	8,774E+03	2,160E+09	8,370E+05	9,019E+05	2,696E+08	8,837E+07	2,317E+08	1,000E+00
	1,000E+00	1,000E+00	1,496E+09	6,640E+08	4,757E-03	0,	8,774E+03	5,461E+01	IIII	2,476E+03
	2,222E+07	6,206E+03	5,377E+05	5,637E+03						
K =13	6,650E+07	3,086E-14	1,234E+04	1,020E+09	9,908E+05	1,080E+06	7,761E+07	4,255E+07	1,173E+08	1,030E+00
	1,000E+00	1,000E+00	6,472E+08	3,725E+08	3,353E-03	0,	1,234E+04	1,388E+01	IIII	1,983E+03
	2,551E+07	5,419E+03	1,964E+05	9,305E+03						

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 60,00

COLUMN (6, 1) = 6

	HC O2 (HTOP)0	RHO END HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2O CO2	O	N2 GAMB
K = 1	9,500E+06	5,082E-10	1,453E+03	6,685E+04	9,756E+03	1,951E+04	7,751E+00	2,842E+03	3,179E+11	8,341E+12
	2,094E+12	2,749E+10	1,000E+00	1,000E+00	6,439E-01	0,	1,453E+03	3,390E+09	IIII	1,354E+02
	9,294E+06	4,900E+08	6,685E+04	4,325E+02						
K = 2	1,075E+07	4,775E-10	1,465E+03	7,027E+04	3,390E+04	4,829E+04	1,850E+03	5,853E+03	3,175E+11	7,836E+12
	1,957E+12	3,717E+10	1,000E+00	1,298E+00	5,609E-01	0,	1,465E+03	3,184E+09	IIII	2,348E+02
	9,729E+06	4,602E+08	7,027E+04	4,003E+02						
K = 3	1,250E+07	1,273E-10	1,969E+03	1,093E+05	6,376E+04	7,924E+04	2,284E+04	4,016E+04	3,124E+11	2,077E+12
	3,928E+11	1,418E+11	1,000E+00	4,694E+00	3,645E-01	0,	1,969E+03	8,426E+08	IIII	1,367E+03
	1,020E+07	1,218E+08	1,093E+05	9,027E+02						
K = 4	1,475E+07	3,282E-11	2,531E+03	1,117E+06	1,010E+05	1,228E+05	3,779E+06	9,551E+05	1,946E+11	5,512E+11
	6,402E+10	2,331E+10	1,000E+00	2,060E+01	2,533E-01	0,	2,531E+03	1,974E+08	IIII	6,447E+02
	1,046E+07	3,029E+07	1,117E+06	2,201E+03						
K = 5	1,750E+07	1,442E-11	3,362E+03	1,313E+06	1,496E+05	1,763E+05	4,510E+06	1,133E+06	1,716E+11	2,541E+11
	1,000E+00	2,305E+08	1,000E+00	2,369E+01	1,649E-01	0,	3,362E+03	7,172E+07	IIII	5,041E+02
	1,069E+07	1,248E+07	1,313E+06	2,803E+03						
K = 6	2,075E+07	1,399E-11	3,380E+03	1,733E+06	2,074E+05	2,385E+05	1,045E+09	4,578E+06	1,676E+11	2,459E+11
	1,000E+00	2,204E+08	1,234E+01	2,587E+01	1,249E-01	0,	3,380E+03	6,921E+07	IIII	5,043E+02
	1,096E+07	1,208E+07	1,733E+06	2,180E+03						
K = 7	2,450E+07	4,673E-12	4,817E+03	1,087E+07	2,721E+05	3,057E+05	2,367E+10	7,947E+07	7,907E+10	6,943E+10
	1,000E+00	1,000E+00	2,588E+02	7,323E+01	9,657E-02	0,	4,817E+03	1,472E+07	IIII	5,087E+02
	1,126E+07	3,482E+06	1,087E+07	4,060E+03						
K = 8	2,900E+07	4,673E-12	4,817E+03	1,087E+07	3,477E+05	3,897E+05	2,367E+10	7,947E+07	7,907E+10	6,943E+10
	1,000E+00	1,000E+00	2,588E+02	7,323E+01	7,258E-02	0,	4,817E+03	1,472E+07	IIII	5,087E+02
	1,164E+07	3,482E+06	1,087E+07	3,051E+03						
K = 9	3,450E+07	2,385E-12	5,892E+03	1,279E+09	4,437E+05	4,977E+05	5,380E+10	1,061E+10	2,403E+10	8,533E+09
	1,000E+00	1,000E+00	8,079E+07	1,136E+09	5,361E-02	0,	5,892E+03	3,726E+06	IIII	5,424E+02
	1,221E+07	1,366E+06	6,252E+07	3,875E+03						
K =10	4,100E+07	1,399E-12	6,244E+03	7,302E+09	5,638E+05	6,299E+05	3,701E+10	6,439E+09	8,851E+09	3,949E+01
	1,000E+00	1,000E+00	3,738E+09	3,525E+09	4,140E-02	0,	6,244E+03	9,123E+05	IIII	5,280E+02
	1,295E+07	4,495E+05	3,860E+07	4,266E+03						
K =11	4,850E+07	7,142E-13	6,210E+03	1,053E+10	7,031E+05	7,763E+05	1,537E+10	1,710E+09	2,615E+09	3,456E+00
	1,000E+00	1,000E+00	6,411E+09	4,111E+09	2,976E-02	0,	6,210E+03	3,038E+03	IIII	5,961E+02
	1,395E+07	4,037E+03	1,230E+07	4,967E+03						
K =12	5,700E+07	3,978E-13	6,594E+03	8,351E+09	8,610E+05	9,457E+05	6,144E+09	7,802E+08	1,275E+09	1,454E+00
	1,000E+00	1,000E+00	5,755E+09	2,591E+09	1,809E-02	0,	6,594E+03	1,346E-01	IIII	7,941E+02
	1,533E+07	1,346E-01	5,961E+06	4,589E+03						
K =13	6,650E+07	2,009E-13	6,621E+03	5,537E+09	1,059E+06	1,172E+06	1,906E+09	3,644E+08	5,302E+08	1,068E+00
	1,000E+00	1,000E+00	3,945E+09	1,590E+09	1,008E-02	0,	6,621E+03	1,613E-01	IIII	1,190E+03
	1,720E+07	1,613E-01	1,926E+06	4,363E+03						

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 90,0

KCYC= 3 TIMDEL= 2,000000E-03 TIMTOT= 7,600000E-02 TTX= 1,136100E+01 DSMALL= 1,008429E+01

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,360862E+06	1,679714E-09	4,552581E+01	3,016171E+23	1,261025E+09	1,059080E+00	0,	9,721725E+06	9,105161E+01
2	1,004046E+07	5,091011E-10	7,913077E+02	2,669664E+23	1,369795E+09	3,486821E-01	0,	1,035919E+07	1,491564E+03
3	1,073212E+07	1,669160E-10	1,819840E+03	3,130278E+23	1,527955E+09	1,275201E-01	0,	1,110506E+07	2,146117E+03
4	1,157288E+07	5,185158E-11	2,833368E+03	3,936958E+23	1,920234E+09	4,978359E-02	0,	1,204070E+07	3,510619E+03
5	1,254737E+07	1,791950E-11	5,368068E+03	4,276750E+23	2,891602E+09	2,590809E-02	0,	1,305404E+07	7,217517E+03
6	1,360981E+07	7,439261E-12	7,747205E+03	4,706502E+23	4,008465E+09	1,491001E-02	0,	1,416558E+07	8,276893E+03
7	1,492790E+07	3,377985E-12	8,462972E+03	6,481907E+23	4,892369E+09	8,263175E-03	0,	1,569023E+07	6,649051E+03
8	1,650790E+07	1,686390E-12	1,567922E+04	6,986269E+23	6,584450E+09	5,551976E-03	0,	1,732558E+07	2,270939E+04
9	1,844074E+07	8,350432E-13	2,551155E+04	9,584428E+23	9,139623E+09	3,815990E-03	0,	1,955589E+07	2,831371E+04
10	2,142703E+07	2,561273E-13	2,240358E+04	1,622868E+24	1,394683E+10	1,786082E-03	6,566681E-05	2,329816E+07	1,649344E+04
11	2,638772E+07	7,671892E-14	3,208327E+04	2,720168E+24	2,045810E+10	7,847618E-04	0,	2,947729E+07	4,767310E+04
12	3,455602E+07	1,919598E-14	7,046741E+04	4,582339E+24	3,428810E+10	3,290968E-04	0,	3,963475E+07	9,320173E+04
13	4,590286E+07	5,874228E-15	1,241984E+05	5,846228E+24	5,291540E+10	1,554166E-04	0,	5,217098E+07	1,551352E+05

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 90,0

KCYC= 5 TIMDEL= 2,000000E-03 TIMTOT= 7,800000E-02 TTX= 1,137000E+01 DSMALL= 7,218728E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,368768E+06	1,643665E-09	-5,015280E+01	3,082322E+23	1,276622E+09	1,049169E+00	1,059751E-03	9,737535E+06	-1,003056E+02
2	1,008903E+07	4,615893E-10	1,898078E+03	2,944455E+23	1,403673E+09	3,239601E-01	0,	1,044051E+07	3,896461E+03
3	1,084110E+07	1,553399E-10	2,909352E+03	3,363551E+23	1,538487E+09	1,194942E-01	2,306063E-03	1,124169E+07	1,922242E+03
4	1,179553E+07	4,376787E-11	4,463357E+03	4,664095E+23	2,136961E+09	4,676513E-02	0,	1,234938E+07	7,004473E+03
5	1,295389E+07	1,500061E-11	1,018558E+04	5,108950E+23	3,423717E+09	2,567892E-02	0,	1,355840E+07	1,330668E+04
6	1,414342E+07	7,055655E-12	1,110564E+04	4,962387E+23	4,531246E+09	1,598545E-02	4,279495E-04	1,472844E+07	8,844597E+03
7	1,548427E+07	3,401217E-12	1,166505E+04	6,437632E+23	5,749251E+09	9,777227E-03	0,	1,624010E+07	1,446550E+04
8	1,709903E+07	1,602496E-12	2,792150E+04	7,352015E+23	7,469909E+09	5,985249E-03	0,	1,795795E+07	4,135751E+04
9	1,904846E+07	8,523405E-13	5,223767E+04	9,389923E+23	1,092534E+10	4,656054E-03	0,	2,013896E+07	6,311784E+04
10	2,242597E+07	2,089179E-13	5,685021E+04	1,989589E+24	2,328117E+10	2,431926E-03	7,647114E-05	2,471298E+07	5,059459E+04
11	2,939907E+07	5,012468E-14	8,962878E+04	4,163386E+24	3,362076E+10	8,426149E-04	0,	3,408516E+07	1,286630E+05
12	4,047506E+07	1,499151E-14	1,683009E+05	5,667488E+24	5,651737E+10	4,386317E-04	0,	4,686497E+07	2,079388E+05
13	5,328335E+07	5,614696E-15	2,622027E+05	6,116555E+24	8,173906E+10	2,294700E-04	0,	5,970174E+07	3,164666E+05

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 90,0

KCYC= 7 TIMDEL= 3,000000E-03 TIMTOT= 8,100000E-02 TTX= 1,138100E+01 DSMALL= 6,638196E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,388790E+06	1,558922E-09	5,053825E+02	3,249877E+23	1,313858E+09	1,024101E+00	0,	9,777580E+06	1,010765E+03
2	1,018817E+07	3,950223E-10	3,186709E+03	3,440638E+23	1,434909E+09	2,834105E-01	0,	1,059877E+07	5,362653E+03
3	1,108399E+07	1,281490E-10	4,833161E+03	4,077235E+23	1,702330E+09	1,090759E-01	1,025685E-03	1,156921E+07	4,303608E+03
4	1,229024E+07	3,356806E-11	8,513631E+03	6,081301E+23	2,784918E+09	4,674215E-02	0,	1,301128E+07	1,272359E+04
5	1,372574E+07	1,266194E-11	1,257191E+04	6,052577E+23	4,506681E+09	2,853166E-02	3,830071E-05	1,444020E+07	1,242023E+04
6	1,500918E+07	7,235403E-12	2,079686E+04	4,839108E+23	5,857292E+09	2,118994E-02	0,	1,557816E+07	2,917349E+04
7	1,655769E+07	2,615826E-12	4,319940E+04	8,370504E+23	6,779101E+09	8,866476E-03	0,	1,753723E+07	5,722531E+04
8	1,871134E+07	1,166557E-12	6,609820E+04	1,009944E+24	1,020538E+10	5,952577E-03	0,	1,988545E+07	7,497109E+04
9	2,150306E+07	5,703247E-13	1,065018E+05	1,403308E+24	1,577118E+10	4,497348E-03	0,	2,312068E+07	1,380324E+05
10	2,693024E+07	1,237238E-13	1,574129E+05	3,359586E+24	4,944876E+10	3,058995E-03	0,	3,073981E+07	1,767933E+05
11	3,887212E+07	2,807861E-14	2,374676E+05	7,432290E+24	7,133712E+10	1,001524E-03	0,	4,700443E+07	2,981418E+05
12	5,539224E+07	1,093372E-14	3,836794E+05	8,045060E+24	1,088462E+11	5,950473E-04	0,	6,378004E+07	4,692169E+05
13	7,141706E+07	4,480268E-15	5,889755E+05	7,667806E+24	1,268947E+11	2,842611E-04	0,	7,905407E+07	7,087341E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 90,0

KCYC= 6 TIMDEL= 3,000000E-03 TIMTOT= 8,400000E-02 TTX= 1,139200E+01 DSMALL= 5,881560E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,469322E+06	1,291101E-09	2,303979E+03	3,924017E+23	1,401642E+09	9,048311E-01	0,	9,938643E+06	4,607957E+03
2	1,046030E+07	3,106590E-10	4,892978E+03	4,374987E+23	1,526580E+09	2,371229E-01	0,	1,096196E+07	5,177998E+03
3	1,172027E+07	8,405505E-11	8,600827E+03	6,216089E+23	2,493031E+09	1,047759E-01	0,	1,245858E+07	1,202366E+04
4	1,352249E+07	2,266355E-11	2,539850E+04	9,007304E+23	4,715884E+09	5,343933E-02	0,	1,458641E+07	3,877335E+04
5	1,560135E+07	8,862114E-12	4,368652E+04	8,647754E+23	5,854989E+09	2,594379E-02	0,	1,661630E+07	4,859968E+04
6	1,783339E+07	3,353368E-12	7,326068E+04	1,044111E+24	7,045561E+09	1,181318E-02	0,	1,905048E+07	9,792168E+04
7	2,073525E+07	1,501602E-12	1,122381E+05	1,458162E+24	1,050648E+10	7,888272E-03	0,	2,242002E+07	1,265545E+05
8	2,535092E+07	4,579963E-13	1,608934E+05	2,572417E+24	2,510204E+10	5,748321E-03	0,	2,828182E+07	1,952323E+05
9	3,280306E+07	1,972227E-13	2,789060E+05	4,058057E+24	5,183847E+10	5,111862E-03	0,	3,732430E+07	3,625797E+05
10	4,539476E+07	5,528303E-14	4,302895E+05	7,518777E+24	1,055841E+11	2,918505E-03	0,	5,346522E+07	4,979993E+05
11	6,552564E+07	1,752298E-14	6,036021E+05	1,190941E+25	1,539687E+11	1,348995E-03	0,	7,758645E+07	7,092049E+05
12	9,072497E+07	6,318589E-15	9,117564E+05	1,392122E+25	1,954100E+11	6,173578E-04	0,	1,038635E+08	1,114308E+06
13	1,168579E+08	2,325149E-15	1,300858E+06	1,477489E+25	1,569583E+11	1,824758E-04	0,	1,298523E+08	1,487409E+06

FOR COLUMN 5 REZONE NUMBER 2 REQUIRED AT TIME 9,000000E+01

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 90,0

KCYC= 5 TIMDEL= 3,000000E-03 TIMTOT= 8,700000E-02 TTX= 1,140200E+01 DSMALL= 8,099585E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,663759E+06	6,925487E-10	2,313036E+03	5,553055E+23	1,801359E+09	6,237643E-01	0,	1,032752E+07	4,626072E+03
2	1,125153E+07	3,068582E-10	1,085883E+04	7,768352E+23	1,854362E+09	2,845131E-01	0,	1,217554E+07	1,709158E+04
3	1,386275E+07	4,126538E-11	4,009483E+04	1,429917E+24	4,148128E+09	8,558705E-02	0,	1,554995E+07	6,309808E+04
4	1,737786E+07	1,489974E-11	8,275519E+04	1,565945E+24	6,685125E+09	4,980332E-02	0,	1,920577E+07	1,024123E+05
5	2,138410E+07	6,971826E-12	1,245440E+05	1,889053E+24	8,351165E+09	2,911143E-02	0,	2,352242E+07	1,466758E+05
6	2,618070E+07	2,618633E-12	1,779688E+05	2,303795E+24	1,436646E+10	1,881025E-02	0,	2,879899E+07	2,092618E+05
7	3,178239E+07	8,907610E-13	2,439037E+05	2,669588E+24	2,848168E+10	1,268519E-02	0,	3,476579E+07	2,785455E+05
8	3,873655E+07	3,795044E-13	3,255558E+05	3,627364E+24	4,702781E+10	8,923631E-03	0,	4,270730E+07	3,725660E+05
9	4,778642E+07	2,165623E-13	4,424264E+05	4,765013E+24	6,425718E+10	6,957841E-03	0,	5,286555E+07	5,122867E+05
10	5,871959E+07	1,418331E-13	5,981269E+05	5,668779E+24	8,043567E+10	5,704220E-03	0,	6,457364E+07	6,839671E+05
11	7,084221E+07	8,686203E-14	7,685400E+05	6,283556E+24	9,442847E+10	4,101124E-03	0,	7,711078E+07	8,531128E+05
12	8,331444E+07	4,504574E-14	9,075541E+05	6,439521E+24	1,151847E+11	2,594290E-03	0,	8,951810E+07	9,619953E+05
13	9,663807E+07	1,993059E-14	1,001518E+06	7,666625E+24	1,717043E+11	1,711084E-03	0,	1,037580E+08	1,041041E+06

FOR COLUMN 6 REZONE NUMBER 2 REQUIRED AT TIME 9,000000E+01

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 90,0

KCYC= 5 TIMDEL= 2,000000E-03 TIMTOT= 8,900000E-02 TTX= 1,141200E+01 DSMALL= 8,964538E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,613568E+06	4,140143E-10	-1,767108E+03	5,132355E+23	2,273601E+09	4,706517E-01	1,004742E-02	1,022714E+07	-3,534216E+03
2	1,144732E+07	2,928625E-10	1,235492E+04	1,026452E+24	1,801338E+09	2,637722E-01	0,	1,266750E+07	2,824406E+04
3	1,419610E+07	8,282646E-11	4,809971E+04	1,296826E+24	4,547190E+09	1,883138E-01	0,	1,572470E+07	6,795536E+04
4	1,775508E+07	2,001788E-11	9,637766E+04	1,741401E+24	1,179643E+10	1,180697E-01	0,	1,978546E+07	1,248000E+05
5	2,200161E+07	9,629074E-12	1,474448E+05	1,925468E+24	1,841480E+10	8,865873E-02	0,	2,421777E+07	1,700897E+05
6	2,689143E+07	8,990810E-12	2,003515E+05	2,357568E+24	1,406130E+10	6,321126E-02	0,	2,956510E+07	2,306133E+05
7	3,263396E+07	2,971842E-12	2,677357E+05	2,753057E+24	3,237216E+10	4,810247E-02	0,	3,570282E+07	3,046582E+05
8	3,945098E+07	3,021243E-12	3,466224E+05	3,431262E+24	2,456483E+10	3,710817E-02	0,	4,319915E+07	3,883866E+05
9	4,782292E+07	1,487734E-12	4,426774E+05	4,338266E+24	3,481482E+10	2,589759E-02	0,	5,244669E+07	4,969682E+05
10	5,801831E+07	8,360950E-13	5,680675E+05	5,384418E+24	4,470513E+10	1,868887E-02	0,	6,356994E+07	6,391668E+05
11	6,998552E+07	4,199149E-13	7,242231E+05	6,395368E+24	6,231249E+10	1,308297E-02	0,	7,638110E+07	8,092795E+05
12	8,350971E+07	2,329690E-13	8,995990E+05	7,403710E+24	6,783961E+10	7,902264E-03	0,	9,063832E+07	9,899186E+05
13	9,865361E+07	1,146275E-13	1,073203E+06	8,676233E+24	7,365510E+10	4,221450E-03	0,	1,066689E+08	1,156488E+06

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,25E+02	4,25E+02	4,06E+04	6,55E+08	1,39E+04	3,32E+11	2,76E+13	7,29E+12	1,54E+08	1,00E+00	1,00E+00	1,06E+00	219,8	217,6
2	5,50E+02	5,50E+02	1,58E+05	7,11E+08	7,23E+04	4,27E+11	8,36E+12	2,05E+12	1,13E+08	1,00E+00	1,90E+00	3,49E-01	255,0	255,0
3	6,01E+02	6,01E+02	1,65E+05	3,39E+08	7,24E+04	2,96E+11	2,74E+12	5,92E+11	2,09E+08	1,00E+00	1,48E+01	1,26E-01	263,7	254,4
4	6,34E+02	6,34E+02	1,63E+05	1,95E+08	6,66E+04	1,29E+11	8,51E+11	1,66E+11	2,25E+08	1,00E+00	7,40E+01	4,99E-02	333,5	314,8
5	7,40E+02	7,40E+02	1,66E+05	1,65E+08	5,80E+04	5,06E+10	2,94E+11	5,44E+10	2,15E+08	1,00E+00	2,51E+02	2,60E-02	482,1	470,0
6	7,95E+02	7,95E+02	1,64E+05	1,17E+08	4,67E+04	2,73E+10	1,21E+11	2,02E+10	1,75E+08	1,00E+00	8,27E+02	1,50E-02	646,4	639,4
7	6,92E+02	[illegible]	1,54E+05	4,55E+07	5,80E+04	1,57E+10	5,42E+10	8,26E+09	7,69E+07	1,00E+00	2,76E+03	8,26E-03	811,7	786,3
8	7,79E+02	[illegible]	2,07E+05	4,03E+07	4,81E+05	9,95E+09	2,64E+10	3,65E+09	5,63E+07	1,79E+00	2,11E+04	5,57E-03	1074,6	1006,4
9	9,33E+02	9,33E+02	4,94E+05	3,75E+07	4,73E+06	6,44E+09	1,25E+10	1,52E+09	3,48E+07	1,46E+01	7,27E+05	3,84E-03	1336,3	1346,5
10	1,80E+03	1,80E+03	4,98E+06	6,66E+07	1,77E+07	2,75E+09	3,49E+09	3,29E+08	2,26E+07	3,72E+02	4,61E+06	1,81E-03	1886,4	1931,9
11	2,82E+03	2,82E+03	6,75E+06	4,83E+07	1,30E+07	1,16E+09	8,86E+08	5,50E+07	5,74E+06	3,35E+05	6,15E+06	7,96E-04	2791,7	2607,5
12	4,59E+03	4,59E+03	1,78E+07	2,77E+07	4,42E+06	3,92E+08	1,57E+08	5,11E+06	7,08E+05	9,37E+06	8,29E+06	3,36E-04	4110,6	3605,6
13	5,11E+03	5,11E+03	1,23E+07	6,49E+06	1,54E+06	1,51E+08	2,77E+07	1,15E+06	2,08E+05	4,94E+06	7,31E+06	1,57E-04	5648,1	5264,1

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,76E+02	4,76E+02	4,51E+04	2,03E+09	1,44E+04	3,30E+11	2,70E+13	7,14E+12	7,47E+06	1,00E+00	1,00E+00	1,05E+00	222,7	220,5
2	6,38E+02	6,36E+02	1,56E+05	2,21E+09	6,25E+04	3,92E+11	7,58E+12	1,85E+12	4,33E+06	1,00E+00	1,89E+00	3,24E-01	249,8	236,9
3	6,30E+02	6,30E+02	1,63E+05	3,95E+08	6,32E+04	2,79E+11	2,55E+12	5,50E+11	1,77E+08	1,00E+00	1,49E+01	1,20E-01	265,9	256,2
4	7,40E+02	7,40E+02	1,55E+05	2,46E+08	5,27E+04	1,12E+11	7,19E+11	1,36E+11	2,31E+08	1,00E+00	7,79E+01	4,70E-02	381,0	349,9
5	8,92E+02	8,92E+02	1,62E+05	1,76E+08	4,50E+04	4,45E+10	2,46E+11	4,44E+10	3,10E+08	1,00E+00	2,68E+02	2,59E-02	578,5	554,6
6	8,43E+02	8,43E+02	1,69E+05	1,15E+08	4,05E+04	2,69E+10	1,15E+11	1,87E+10	2,33E+08	1,00E+00	9,03E+02	1,61E-02	714,9	720,7
7	8,20E+02	8,20E+02	1,64E+05	6,67E+07	5,54E+04	1,63E+10	5,45E+10	8,04E+09	1,34E+08	1,00E+00	2,93E+03	9,81E-03	967,0	897,6
8	9,77E+02	9,77E+02	2,05E+05	5,58E+07	4,70E+04	9,75E+09	2,50E+10	3,29E+09	1,05E+08	2,82E+00	1,93E+04	6,03E-03	1366,9	1145,6
9	1,22E+03	1,22E+03	1,13E+06	7,05E+07	6,12E+06	6,75E+09	1,27E+10	1,45E+09	7,38E+07	2,79E+01	7,91E+05	4,72E-03	1719,6	1604,4
10	3,35E+03	3,35E+03	5,50E+06	1,60E+08	3,36E+07	2,49E+09	2,76E+09	1,49E+08	4,10E+07	1,65E+03	2,65E+06	2,49E-03	3036,6	3114,9
11	5,41E+03	5,41E+03	1,46E+07	1,16E+08	1,34E+07	8,27E+08	5,28E+08	6,52E+06	3,29E+06	9,57E+06	4,44E+06	8,66E-04	4711,3	4025,9
12	6,45E+03	6,45E+03	5,09E+07	6,31E+07	7,68E+06	3,06E+08	9,53E+07	7,82E+05	1,69E+06	1,88E+07	1,19E+07	4,51E-04	6577,4	5906,4
13	6,87E+03	6,87E+03	1,96E+07	1,31E+07	2,53E+06	1,40E+08	2,07E+07	6,55E+05	1,07E+06	7,93E+06	1,16E+07	2,31E-04	8686,0	7741,1

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,62E+02	5,62E+02	5,18E+04	8,91E+09	1,48E+04	3,23E+11	2,56E+13	6,76E+12	7,07E+05	1,00E+00	1,00E+00	1,02E+00	231,5	226,9
2	7,38E+02	7,38E+02	1,45E+05	5,31E+09	4,77E+04	3,41E+11	6,48E+12	1,56E+12	9,87E+05	1,00E+00	1,88E+00	2,83E-01	267,7	244,2
3	7,47E+02	7,47E+02	1,58E+05	9,18E+08	4,49E+04	2,37E+11	2,10E+12	4,51E+11	4,50E+07	1,00E+00	1,59E+01	1,04E-01	296,5	283,0
4	9,36E+02	9,36E+02	1,47E+05	2,46E+08	3,65E+04	9,26E+10	5,51E+11	1,03E+11	2,98E+08	1,00E+00	8,87E+01	4,70E-02	496,6	453,7
5	1,05E+03	1,05E+03	1,60E+05	5,00E+07	3,16E+04	4,14E+10	2,08E+11	3,55E+10	7,39E+08	1,00E+00	3,08E+02	2,87E-02	756,0	724,5
6	9,00E+02	9,00E+02	1,74E+05	5,36E+07	3,87E+04	2,95E+10	1,18E+11	1,81E+10	4,06E+08	1,00E+00	1,04E+03	2,13E-02	929,4	926,8
7	1,09E+03	1,09E+03	1,14E+05	2,67E+07	1,00E+00	1,35E+10	4,18E+10	5,63E+09	3,50E+08	1,00E+00	2,23E+03	8,94E-03	1444,0	1066,4
8	1,56E+03	1,56E+03	1,90E+05	3,81E+07	1,03E+00	7,96E+09	1,81E+10	1,94E+09	2,70E+08	4,28E+00	1,15E+04	6,04E-03	2042,5	1546,8
9	2,23E+03	2,23E+03	5,04E+05	6,49E+07	2,31E+06	5,13E+09	8,42E+09	6,28E+08	2,39E+08	5,02E+01	1,36E+05	4,61E-03	2829,8	2283,3
10	7,23E+03	7,23E+03	6,98E+06	7,25E+08	7,35E+07	1,73E+09	1,34E+09	1,00E+00	4,29E+06	4,75E+06	2,47E+05	3,09E-03	6068,5	5696,4
11	7,30E+03	7,30E+03	2,40E+07	3,78E+08	6,78E+07	4,64E+08	1,36E+08	1,00E+00	7,09E+06	1,82E+07	4,85E+06	1,04E-03	7868,7	6600,8
12	8,65E+03	8,65E+03	4,73E+07	1,12E+08	2,81E+07	2,13E+08	2,47E+07	1,00E+00	2,86E+06	2,79E+07	1,90E+07	6,06E-04	11083,8	9283,8
13	9,42E+03	9,42E+03	2,62E+07	2,02E+07	5,90E+06	1,05E+08	7,87E+06	1,62E+05	2,51E+06	1,03E+07	1,57E+07	2,87E-04	14559,3	11157,2

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 60.00 TDAT2 = 90.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7.29E+02	7.29E+02	5.49E+04	3.52E+10	1.21E+04	2.89E+11	2.12E+13	5.59E+12	2.47E+06	1.00E+00	1.00E+00	9.05E-01	260.7	242.0
2	8.83E+02	8.85E+02	1.36E+05	1.01E+10	2.58E+04	2.79E+11	5.10E+12	1.24E+12	1.65E+06	1.00E+00	1.92E+00	2.37E-01	285.0	259.6
3	1.04E+03	1.04E+03	1.37E+05	5.60E+08	2.07E+04	1.70E+11	1.38E+12	2.85E+11	1.78E+08	1.00E+00	1.92E+01	1.05E-01	449.0	412.1
4	1.39E+03	1.39E+03	1.22E+05	2.22E+04	2.04E+04	7.76E+10	3.71E+11	6.09E+10	5.72E+09	1.00E+00	1.04E+02	5.34E-02	876.9	756.0
5	1.14E+03	1.14E+03	1.14E+05	1.92E+04	8.66E+03	3.47E+10	1.45E+11	2.16E+10	2.49E+09	1.00E+00	3.66E+02	2.59E-02	1061.3	927.9
6	1.37E+03	1.37E+03	6.67E+04	2.62E+04	2.80E+03	1.67E+10	5.43E+10	6.69E+09	1.73E+09	1.00E+00	7.36E+02	1.14E-02	1572.0	1112.5
7	2.08E+03	2.08E+03	9.73E+04	3.99E+04	5.80E+04	9.79E+09	2.38E+10	2.05E+09	1.61E+09	1.00E+00	1.84E+03	7.84E-03	2001.0	1575.3
8	5.51E+03	5.51E+03	1.25E+06	4.37E+08	3.27E+07	4.93E+09	6.88E+09	1.00E+00	3.12E+07	5.60E+02	1.52E+03	5.82E-03	4452.1	3420.0
9	8.07E+03	8.07E+03	2.06E+06	1.95E+09	2.58E+07	2.50E+09	2.19E+09	1.00E+00	1.28E+08	3.47E+03	3.26E+03	5.59E-03	7435.0	5621.4
10	9.58E+03	9.58E+03	3.58E+08	1.06E+09	2.90E+08	6.59E+08	2.69E+06	1.00E+00	3.02E+04	2.84E+08	6.98E+07	2.93E-03	9175.2	7759.6
11	1.09E+04	1.09E+04	2.51E+08	1.84E+08	7.52E+07	2.16E+08	1.27E+05	1.00E+00	3.13E+03	1.74E+08	7.65E+07	1.35E-03	11728.3	9770.7
12	1.39E+04	1.39E+04	8.92E+07	4.63E+07	2.68E+07	9.53E+07	6.89E+05	1.00E+00	1.46E+05	4.94E+07	3.96E+07	6.20E-04	16078.8	13273.6
13	1.16E+04	1.16E+04	2.54E+07	1.09E+07	6.38E+06	4.68E+07	9.18E+05	4.73E+03	1.82E+06	9.34E+06	1.59E+07	1.84E-04	16973.6	11830.7

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 60.00 TDAT2 = 90.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.06E+03	1.06E+03	5.57E+04	3.59E+09	5.43E+03	2.67E+11	1.14E+13	2.94E+12	5.48E+07	1.00E+00	1.00E+00	6.26E-01	359.5	311.2
2	1.16E+03	1.16E+03	9.73E+04	1.41E+01	8.99E+03	2.51E+11	5.04E+12	1.24E+12	2.72E+09	1.00E+00	1.00E+00	2.95E-01	351.7	316.3
3	1.70E+03	1.70E+03	5.94E+04	2.24E+03	7.27E+03	1.15E+11	6.74E+11	1.22E+11	4.40E+10	1.00E+00	1.47E+01	8.56E-02	641.2	671.6
4	1.99E+03	1.99E+03	6.48E+04	7.30E+03	1.74E+04	6.59E+10	2.42E+11	3.06E+10	3.15E+10	1.00E+00	6.27E+01	4.94E-02	1230.0	1006.9
5	2.16E+03	2.16E+03	7.15E+04	3.72E+03	2.59E+04	4.01E+10	1.13E+11	9.47E+09	2.03E+10	1.00E+00	1.70E+02	2.91E-02	1467.0	1205.2
6	3.31E+03	3.31E+03	1.69E+05	1.04E+02	2.71E+04	2.00E+10	4.26E+10	1.82E+09	5.39E+09	1.00E+00	2.88E+02	1.84E-02	2511.0	2026.2
7	7.16E+03	7.16E+03	6.31E+07	6.06E+09	5.21E+08	9.06E+09	1.17E+10	1.00E+00	3.24E+03	5.10E+07	1.23E+06	1.40E-02	4209.2	3392.1
8	8.61E+03	8.61E+03	5.19E+08	1.06E+10	2.07E+09	2.60E+09	8.53E+01	1.00E+00	1.00E+00	2.85E+08	2.24E+08	8.96E-03	5155.0	4003.9
9	5.99E+03	5.99E+03	2.68E+09	4.70E+09	4.87E+08	1.17E+09	3.77E+00	1.00E+00	1.00E+00	1.79E+09	8.81E+08	7.03E-03	5526.8	4127.2
10	5.88E+03	5.88E+03	2.76E+09	2.27E+09	2.03E+08	7.23E+08	1.14E+00	1.00E+00	1.00E+00	1.89E+09	8.68E+08	5.75E-03	5976.5	4462.6
11	6.18E+03	6.18E+03	2.11E+09	1.01E+09	9.78E+07	4.41E+08	1.04E+00	1.00E+00	1.00E+00	1.40E+09	6.49E+08	4.12E-03	6059.2	4652.6
12	6.59E+03	6.59E+03	1.43E+09	2.29E+08	3.08E+07	1.59E+08	1.00E+00	1.00E+00	1.00E+00	9.88E+08	4.44E+08	2.60E-03	5636.8	4605.5
13	9.55E+03	9.55E+03	6.55E+08	6.12E+07	1.94E+07	7.60E+07	1.00E+00	1.00E+00	1.00E+00	4.15E+08	2.40E+08	1.71E-03	9305.3	7435.6

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 60.00 TDAT2 = 90.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.43E+03	1.43E+03	4.67E+04	3.23E+03	4.65E+03	2.59E+11	6.80E+12	1.71E+12	2.80E+10	1.00E+00	1.00E+00	4.71E-01	432.5	389.6
2	1.44E+03	1.44E+03	3.68E+04	1.55E+03	2.88E+03	1.95E+11	4.61E+12	1.20E+12	3.72E+10	1.00E+00	1.00E+00	2.64E-01	400.3	311.3
3	1.96E+03	1.96E+03	5.93E+04	1.70E+03	6.20E+02	2.03E+11	1.35E+12	2.56E+11	1.42E+11	1.00E+00	4.66E+00	1.88E-01	902.7	724.3
4	2.53E+03	2.53E+03	2.63E+05	1.01E+00	1.00E+00	1.19E+11	3.36E+11	3.91E+10	2.33E+10	1.00E+00	1.70E+01	1.16E-01	2201.3	1706.9
5	3.36E+03	3.36E+03	3.82E+05	2.52E+06	5.22E+05	1.15E+11	1.70E+11	1.00E+00	2.29E+08	1.00E+00	3.38E+01	8.87E-02	2803.1	2279.5
6	3.38E+03	3.36E+03	5.91E+05	5.63E+08	1.88E+06	1.06E+11	1.58E+11	1.00E+00	1.10E+08	2.01E+00	3.35E+01	6.35E-02	2160.4	1737.6
7	4.82E+03	4.82E+03	5.29E+06	1.51E+10	5.27E+07	5.03E+10	4.42E+10	1.00E+00	1.00E+00	3.42E+02	9.74E+01	4.81E-02	4060.1	3216.4
8	4.82E+03	4.82E+03	3.77E+06	1.53E+10	5.43E+07	5.11E+10	4.49E+10	1.00E+00	1.00E+00	3.87E+02	1.01E+02	3.71E-02	3051.5	2440.0
9	8.96E+03	8.96E+03	1.38E+08	3.54E+10	6.14E+09	1.56E+10	4.59E+09	1.00E+00	1.00E+00	2.71E+07	3.18E+06	2.73E-02	3875.2	3040.7
10	6.30E+03	6.30E+03	3.98E+09	2.33E+10	3.16E+09	5.19E+09	7.89E+00	1.00E+00	1.00E+00	1.75E+09	2.21E+09	1.91E-02	4266.1	3272.7
11	5.28E+03	5.28E+03	5.65E+09	9.82E+09	6.91E+08	1.61E+09	1.98E+00	1.00E+00	1.00E+00	3.30E+09	2.35E+09	1.32E-02	4967.0	3777.0
12	5.00E+03	5.00E+03	4.54E+09	4.06E+09	2.93E+08	8.02E+08	1.17E+00	1.00E+00	1.00E+00	3.08E+09	1.46E+09	7.97E-03	4589.0	3482.1
13	5.06E+03	5.06E+03	3.02E+09	1.32E+09	9.72E+07	3.28E+08	1.03E+00	1.00E+00	1.00E+00	2.15E+09	6.82E+08	4.24E-03	4363.0	3263.9

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 90,00

COLUMN (4, 1) = 4

	HC O2 (HTUP)O	RHO END HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	O	N2 QAMB
K = 1	9,500E+06	1,231E-09	7,325E+02	6,370E+04	2,321E+03	4,641E+03	3,368E+10	1,294E+04	2,886E+11	2,019E+13
	5,323E+12	2,419E+06	1,000E+00	1,056E+00	8,684E-01	0,	7,325E+02	8,281E+09	IIII	5,278E+02
	9,735E+06	1,197E+09	6,370E+04	2,433E+02						
K = 2	1,075E+07	2,323E-10	9,047E+02	1,365E+05	6,111E+03	7,580E+03	6,778E+09	2,404E+04	2,438E+11	3,811E+12
	9,099E+11	6,251E+07	1,000E+00	7,886E+00	1,968E-01	0,	9,047E+02	1,528E+09	IIII	3,198E+03
	1,053E+07	2,256E+08	1,365E+05	2,866E+02						
K = 3	1,250E+07	5,204E-11	1,129E+03	1,292E+05	1,635E+04	2,512E+04	2,681E+08	2,058E+04	1,255E+11	8,540E+11
	1,680E+11	3,070E+09	1,000E+00	6,348E+01	7,848E-02	0,	1,129E+03	2,726E+08	IIII	2,692E+03
	1,132E+07	5,004E+07	1,291E+05	4,938E+02						
K = 4	1,475E+07	1,485E-11	1,313E+03	1,173E+05	3,537E+04	4,562E+04	2,048E+04	1,377E+04	5,326E+10	2,431E+11
	3,867E+10	3,893E+09	1,000E+00	2,523E+02	3,488E-02	0,	1,313E+03	5,101E+07	IIII	2,400E+03
	1,226E+07	1,482E+07	1,171E+05	7,453E+02						
K = 5	1,750E+07	4,481E-12	1,283E+03	7,627E+04	7,126E+04	9,690E+04	2,478E+04	4,001E+03	2,034E+10	7,288E+10
	9,749E+09	1,884E+09	1,000E+00	6,606E+02	1,329E-02	0,	1,283E+03	7,952E+06	IIII	1,964E+03
	1,338E+07	7,267E+06	7,561E+04	9,178E+02						
K = 6	2,075E+07	1,504E-12	2,083E+03	1,234E+05	1,122E+05	1,275E+05	1,007E+07	8,074E+05	9,777E+09	2,386E+10
	2,068E+09	1,572E+09	1,385E+01	1,816E+03	7,881E-03	0,	2,083E+03	1,582E+06	IIII	2,042E+03
	1,472E+07	5,416E+06	1,216E+05	1,530E+03						
K = 7	2,450E+07	4,580E-13	5,511E+03	1,253E+06	1,509E+05	1,744E+05	4,369E+08	3,272E+07	4,932E+09	6,884E+09
	1,000E+00	3,121E+07	5,605E+02	1,524E+03	6,158E-03	0,	5,511E+03	3,041E+05	IIII	1,713E+03
	1,581E+07	2,858E+06	1,251E+06	3,620E+03						
K = 8	2,900E+07	2,897E-13	6,460E+03	1,775E+06	2,146E+05	2,548E+05	1,411E+09	2,823E+07	3,363E+09	3,857E+09
	1,000E+00	9,378E+07	2,438E+03	2,643E+03	5,706E-03	0,	6,460E+03	1,546E+05	IIII	2,091E+03
	1,723E+07	2,380E+06	1,770E+06	4,718E+03						
K = 9	3,450E+07	1,930E-13	7,992E+03	1,257E+07	3,094E+05	3,641E+05	1,920E+09	3,356E+07	2,447E+09	2,130E+09
	1,000E+00	1,244E+08	8,406E+06	2,066E+06	5,122E-03	0,	7,992E+03	7,037E+04	IIII	2,292E+03
	1,894E+07	2,073E+06	2,094E+06	5,548E+03						
K =10	4,100E+07	5,528E-14	9,583E+03	3,577E+08	3,934E+05	4,228E+05	1,063E+09	2,898E+08	6,592E+08	2,689E+06
	1,000E+00	3,024E+04	2,845E+08	6,985E+07	3,672E-03	0,	9,583E+03	5,465E+03	IIII	2,046E+03
	2,050E+07	6,220E+05	3,370E+06	9,764E+03						
K =11	4,850E+07	5,528E-14	9,583E+03	3,577E+08	4,563E+05	4,899E+05	1,063E+09	2,898E+08	6,592E+08	2,689E+06
	1,000E+00	3,024E+04	2,845E+08	6,985E+07	2,602E-03	0,	9,583E+03	5,465E+03	IIII	2,046E+03
	2,228E+07	6,220E+05	3,370E+06	6,497E+03						
K =12	5,700E+07	2,153E-14	1,066E+04	2,624E+08	5,291E+05	5,684E+05	2,816E+08	9,792E+07	2,627E+08	3,985E+05
	1,000E+00	6,002E+03	1,854E+08	7,582E+07	1,876E-03	0,	1,066E+04	9,667E+02	IIII	1,342E+03
	2,423E+07	2,893E+05	1,221E+06	1,192E+04						
K =13	6,650E+07	1,752E-14	1,087E+04	2,511E+08	6,121E+05	6,559E+05	1,889E+08	7,516E+07	2,157E+08	1,269E+05
	1,000E+00	3,128E+03	1,736E+08	7,653E+07	1,311E-03	0,	1,087E+04	4,333E+02	IIII	1,258E+03
	2,639E+07	2,499E+05	9,665E+05	9,251E+03						

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 90,00

COLUMN (5, 1) = 5

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN49	EN2D	O	N2
	O2	END	ENP	OP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,500E+06	6,925E-10	1,061E+03	5,374E+04	1,742E+03	3,485E+03	3,589E+09	5,434E+03	2,673E+11	1,137E+13
	2,943E+12	5,480E+07	1,000E+00	1,000E+00	6,256E-01	0,	1,061E+03	4,644E+09	IIII	1,845E+02
	9,400E+06	6,712E+08	5,374E+04	3,106E+02						
K = 2	1,075E+07	3,909E-10	1,122E+03	8,782E+04	8,010E+03	1,253E+04	7,822E+08	8,215E+03	2,544E+11	6,421E+12
	1,610E+12	2,136E+09	1,000E+00	1,000E+00	3,740E-01	0,	1,122E+03	2,620E+09	IIII	1,331E+03
	9,964E+06	3,787E+08	8,782E+04	3,267E+02						
K = 3	1,250E+07	1,308E-10	1,290E+03	7,220E+04	2,384E+04	3,515E+04	1,490E+03	7,853E+03	1,608E+11	2,146E+12
	4,985E+11	3,012E+10	1,000E+00	1,007E+01	1,632E-01	0,	1,290E+03	8,547E+08	IIII	1,292E+03
	1,044E+07	1,265E+08	7,218E+04	4,168E+02						
K = 4	1,475E+07	3,650E-11	1,726E+03	6,039E+04	5,154E+04	6,794E+04	3,153E+03	9,106E+03	1,062E+11	5,962E+11
	1,057E+11	4,178E+10	1,000E+00	2,336E+01	7,465E-02	0,	1,726E+03	2,127E+08	IIII	1,094E+03
	1,086E+07	3,509E+07	6,036E+04	6,361E+02						
K = 5	1,750E+07	1,490E-11	1,989E+03	6,479E+04	8,407E+04	1,002E+05	7,295E+03	1,742E+04	6,594E+10	2,424E+11
	3,080E+10	3,151E+10	1,000E+00	6,273E+01	4,899E-02	0,	1,989E+03	7,218E+07	IIII	1,016E+03
	1,131E+07	1,425E+07	6,473E+04	9,574E+02						
K = 6	2,075E+07	7,436E-12	2,140E+03	7,111E+04	1,180E+05	1,359E+05	3,928E+03	2,541E+04	4,157E+10	1,206E+11
	1,072E+10	2,099E+10	1,000E+00	1,641E+02	3,169E-02	0,	2,140E+03	2,759E+07	IIII	1,028E+03
	1,187E+07	7,233E+06	7,095E+04	1,184E+03						
K = 7	2,450E+07	3,770E-12	2,762E+03	1,435E+05	1,588E+05	1,818E+05	1,060E+03	2,681E+04	2,527E+10	6,122E+10
	3,843E+09	9,343E+09	1,000E+00	2,570E+02	2,199E-02	0,	2,762E+03	1,029E+07	IIII	9,335E+02
	1,253E+07	4,236E+06	1,433E+05	1,598E+03						
K = 8	2,900E+07	1,682E-12	4,292E+03	3,426E+07	2,112E+05	2,406E+05	3,286E+09	2,826E+08	1,404E+10	2,583E+10
	8,327E+08	2,468E+09	2,763E+07	6,643E+05	1,625E-02	0,	4,292E+03	2,918E+06	IIII	7,632E+02
	1,327E+07	2,446E+06	5,964E+06	2,512E+03						
K = 9	3,450E+07	6,566E-13	7,183E+03	2,718E+08	2,758E+05	3,109E+05	8,125E+09	1,230E+09	6,100E+09	6,320E+09
	1,000E+00	1,754E+03	1,582E+08	1,032E+08	1,176E-02	0,	7,183E+03	7,027E+05	IIII	5,888E+02
	1,398E+07	1,292E+06	1,047E+07	3,776E+03						
K =10	4,100E+07	3,375E-13	7,265E+03	1,076E+09	3,541E+05	3,972E+05	9,053E+09	1,661E+09	2,231E+09	6,423E+01
	1,000E+00	1,000E+00	6,738E+08	3,934E+08	8,448E-03	0,	7,265E+03	1,818E+05	IIII	5,539E+02
	1,472E+07	6,535E+05	8,401E+06	3,807E+03						
K =11	4,850E+07	2,166E-13	5,987E+03	2,676E+09	4,522E+05	5,073E+05	4,699E+09	4,872E+08	1,168E+09	3,773E+00
	1,000E+00	1,000E+00	1,792E+09	8,808E+08	6,937E-03	0,	5,987E+03	5,088E+04	IIII	6,550E+02
	1,564E+07	2,475E+05	3,806E+06	3,790E+03						
K =12	5,700E+07	1,448E-13	5,694E+03	2,757E+09	5,731E+05	6,389E+05	2,367E+09	2,140E+08	7,412E+08	1,247E+00
	1,000E+00	1,000E+00	1,887E+09	8,686E+08	5,933E-03	0,	5,694E+03	9,563E+03	IIII	1,001E+03
	1,698E+07	1,102E+05	1,914E+06	4,486E+03						
K =13	6,650E+07	1,036E-13	5,996E+03	2,305E+09	7,082E+05	7,774E+05	1,394E+09	1,297E+08	5,272E+08	1,071E+00
	1,000E+00	1,000E+00	1,588E+09	7,159E+08	4,642E-03	0,	5,996E+03	3,664E+03	IIII	1,273E+03
	1,869E+07	6,991E+04	1,242E+06	4,547E+03						

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 90.00

COLUMN (6, 1) = 6

	HC	RHO	T ELECT	ENE	VCENTR	VEL	ENUS	EN2D	O	N2
	O2	ENO	ENP	OP	P	Q	T N2VIB	CU2		QAMH
	(HTURB)	HF	M+	TH						
K = 1	9.500E+06	4.140E-10	1.426E+03	4.672E+04	-1.440E+03	-2.880E+03	3.227E+03	4.655E+03	2.590E+11	6.795E+12
	1.706E+12	2.799E+10	1.000E+00	1.000E+00	4.707E-01	1.122E-02	1.426E+03	2.762E+09	IIII	1.103E+02
	9.240E+06	3.991E+08	4.672E+04	3.878E+02						
K = 2	1.075E+07	3.112E-10	1.437E+03	3.826E+04	5.080E+03	1.304E+04	1.801E+03	3.147E+03	2.044E+11	5.107E+12
	1.271E+12	3.578E+10	1.000E+00	1.000E+00	3.287E-01	0.	1.437E+03	2.075E+09	IIII	1.389E+02
	9.521E+06	2.949E+08	3.826E+04	3.594E+02						
K = 3	1.250E+07	2.053E-10	1.535E+03	4.616E+04	2.605E+04	3.906E+04	1.612E+03	1.937E+03	1.983E+11	3.366E+12
	6.064E+11	8.081E+10	1.000E+00	2.527E+00	2.318E-01	0.	1.535E+03	1.567E+09	IIII	4.549E+02
	9.656E+06	1.976E+08	4.615E+04	3.771E+02						
K = 4	1.475E+07	7.569E-11	1.979E+03	8.183E+04	5.543E+04	7.181E+04	1.513E+03	5.515E+02	1.940E+11	1.240E+12
	2.317E+11	1.287E+11	1.000E+00	6.026E+00	1.751E-01	0.	1.979E+03	5.011E+08	IIII	8.347E+02
	1.022E+07	7.254E+07	8.182E+04	7.069E+02						
K = 5	1.750E+07	2.002E-11	2.530E+03	2.632E+05	9.281E+04	1.138E+05	1.009E+00	1.000E+00	1.187E+11	3.363E+11
	5.305E+10	2.331E+10	1.000E+00	1.701E+01	1.221E-01	0.	2.530E+03	1.204E+08	IIII	3.933E+02
	1.041E+07	1.848E+07	2.632E+05	1.709E+03						
K = 6	2.075E+07	1.195E-11	3.065E+03	3.557E+05	1.332E+05	1.525E+05	1.953E+06	4.055E+05	1.155E+11	2.069E+11
	8.726E+09	5.387E+09	1.000E+00	3.006E+01	9.648E-02	0.	3.065E+03	6.409E+07	IIII	3.492E+02
	1.060E+07	1.060E+07	3.557E+05	2.076E+03						
K = 7	2.450E+07	9.264E-12	3.371E+03	5.015E+05	1.742E+05	1.959E+05	3.231E+06	1.299E+06	1.107E+11	1.650E+11
	1.000E+00	1.612E+08	1.575E+00	3.363E+01	7.476E-02	0.	3.371E+03	4.593E+07	IIII	3.293E+02
	1.081E+07	8.005E+06	5.015E+05	1.974E+03						
K = 8	2.900E+07	6.651E-12	3.600E+03	2.419E+06	2.250E+05	2.540E+05	6.195E+09	2.163E+07	8.543E+10	1.138E+11
	1.000E+00	6.741E+07	1.343E+02	5.836E+01	5.735E-02	0.	3.600E+03	3.082E+07	IIII	3.238E+02
	1.106E+07	5.605E+06	2.419E+06	2.021E+03						
K = 9	3.450E+07	2.987E-12	4.816E+03	4.834E+06	2.895E+05	3.249E+05	1.513E+10	5.318E+07	5.054E+10	4.438E+10
	1.000E+00	1.000E+00	3.557E+02	9.855E+01	4.481E-02	0.	4.816E+03	9.411E+06	IIII	3.251E+02
	1.136E+07	2.226E+06	4.834E+06	2.947E+03						
K =10	4.100E+07	2.734E-12	4.952E+03	2.884E+07	3.643E+05	4.037E+05	1.908E+10	1.195E+09	4.447E+10	3.734E+10
	1.000E+00	1.000E+00	5.082E+06	5.957E+05	3.507E-02	0.	4.952E+03	8.171E+06	IIII	3.307E+02
	1.172E+07	1.989E+06	2.316E+07	2.486E+03						
K =11	4.850E+07	1.483E-12	8.850E+03	1.634E+08	4.507E+05	4.976E+05	3.537E+10	6.123E+09	1.556E+10	4.564E+09
	1.000E+00	1.000E+00	3.871E+07	1.807E+07	2.669E-02	0.	8.850E+03	2.312E+06	IIII	3.382E+02
	1.222E+07	8.442E+05	1.067E+08	3.107E+03						
K =12	5.700E+07	8.361E-13	6.299E+03	3.975E+09	5.551E+05	6.125E+05	2.331E+10	3.157E+09	5.193E+09	7.891E+00
	1.000E+00	1.000E+00	1.746E+09	2.212E+09	1.977E-02	0.	6.299E+03	5.454E+05	IIII	3.156E+02
	1.281E+07	2.687E+05	1.647E+07	3.315E+03						
K =13	6.650E+07	5.059E-13	5.450E+03	5.307E+09	6.784E+05	7.444E+05	1.261E+10	1.201E+09	2.351E+09	3.199E+00
	1.000E+00	1.000E+00	2.981E+09	2.319E+09	1.473E-02	0.	5.450E+03	1.141E+05	IIII	3.433E+02
	1.357E+07	5.741E+04	7.233E+06	3.622E+03						

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 120,0

*CYC= 3 TIMDEL= 2,000000E-03 TIMTOT= 9,100000E-02 TTX= 1,160900E+01 DSMALL= 1,175903E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,356907E+06	1,688874E-09	-1,811848E+01	2,499808E+23	1,264822E+09	1,068063E+00	1,539846E-03	9,717813E+06	-3,623695E+01
2	1,006154E+07	4,720314E-10	3,406143E+02	2,689019E+23	1,318906E+09	3,112825E-01	0.	1,040530E+07	7,174656E+02
3	1,077645E+07	1,276955E-10	6,842301E+02	3,115729E+23	1,534358E+09	1,286525E-01	3,236381E-04	1,114759E+07	6,509946E+02
4	1,180168E+07	5,842947E-11	-5,025502E+02	3,521049E+23	1,954344E+09	5,220489E-02	9,542132E-04	1,205561E+07	-1,656095E+03
5	1,262861E+07	1,584132E-11	-6,276824E+01	4,637814E+23	2,724659E+09	2,156111E-02	0.	1,320161E+07	1,530559E+03
6	1,381004E+07	6,791196E-12	4,285869E+03	5,155630E+23	3,841206E+09	1,304319E-02	0.	1,441847E+07	7,041180E+03
7	1,575365E+07	3,500260E-12	7,214312E+03	6,255073E+23	4,987038E+09	8,727966E-03	5,886193E-05	1,588864E+07	7,367445E+03
8	1,688569E+07	1,681388E-12	1,003896E+04	8,528796E+23	5,942854E+09	4,104693E-03	0.	1,788245E+07	1,269048E+04
9	1,922179E+07	6,938764E-13	2,403281E+04	1,155435E+24	8,345797E+09	2,895478E-03	0.	2,056063E+07	3,557513E+04
10	2,233413E+07	2,691855E-13	3,750983E+04	1,542024E+24	1,452248E+10	1,956800E-03	0.	2,410762E+07	3,964453E+04
11	2,760030E+07	6,756687E-14	4,951895E+04	3,089942E+24	1,947114E+10	6,575101E-04	0.	3,110115E+07	5,939337E+04
12	3,066847E+07	1,678819E-14	8,265964E+04	5,239546E+24	3,283755E+10	2,756415E-04	0.	4,263579E+07	1,059259E+05
13	4,446940E+07	4,961114E-15	1,454369E+05	6,424619E+24	4,882622E+10	1,211162E-04	0.	5,730401E+07	1,649479E+05

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 120.0

*CYC= 4 TIMDEL= 2,000000E-03 TIMTOT= 9,300000E-02 TTX= 1,161800E+01 DSMALL= 9,717971E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,370502E+06	1,635961E-09	3,162002E+02	3,096836E+23	1,273718E+09	1,041876E+00	0.	9,741004E+06	6,324004E+02
2	1,012132E+07	4,265596E-10	-1,983346E+02	3,186258E+23	1,348109E+09	2,875244E-01	2,790754E-03	1,050164E+07	-1,029070E+03
3	1,088415E+07	1,589154E-10	2,297259E+02	3,687872E+23	1,559149E+09	1,238864E-01	0.	1,128406E+07	1,486521E+03
4	1,165195E+07	4,272289E-11	-2,702602E+02	4,770176E+23	2,119467E+09	4,527469E-02	1,114313E-03	1,241924E+07	-2,029042E+03
5	1,311133E+07	1,303946E-11	-1,469014E+02	5,077345E+23	3,211080E+09	2,093537E-02	0.	1,380941E+07	1,735239E+03
6	1,443091E+07	6,635696E-12	7,433860E+03	5,270446E+23	4,409304E+09	1,462940E-02	0.	1,505242E+07	1,315248E+04
7	1,586930E+07	3,067662E-12	1,016082E+04	7,137613E+23	5,472278E+09	8,393550E-03	0.	1,672636E+07	1,916915E+04
8	1,786350E+07	1,207600E-12	2,340584E+04	9,756193E+23	6,469756E+09	3,906437E-03	0.	1,900065E+07	2,762255E+04
9	2,057706E+07	5,666563E-13	4,601554E+04	1,364242E+24	9,052203E+09	2,655206E-03	0.	2,215467E+07	6,440856E+04
10	2,454397E+07	1,986959E-13	8,120204E+04	2,091950E+24	2,320227E+10	2,305092E-03	0.	2,693327E+07	9,794553E+04
11	3,250452E+07	4,177041E-14	1,169445E+05	4,990082E+24	3,101440E+10	6,560962E-04	0.	3,807577E+07	1,350934E+05
12	4,576479E+07	1,226616E-14	1,830369E+05	7,171151E+24	5,414461E+10	3,320732E-04	0.	5,345361E+07	2,301805E+05
13	6,177964E+07	4,223569E-15	3,009795E+05	8,133800E+24	7,084702E+10	1,496143E-04	0.	7,010587E+07	3,717766E+05

FOR COLUMN 3 REZONE NUMBER 1 REQUIRED AT TIME 1,200000E+02

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 120,0

*CYC= 5 TIMDEL= 3,000000E-03 TIMTOT= 9,600000E-02 TTX= 1,162900E+01 DSMALL= 8,371155E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9,405543E+06	1,494445E-09	4,747198E+02	3,390091E+23	1,286247E+09	9,611123E-01	0.	9,811086E+06	9,694397E+02
2	1,023447E+07	3,430313E-10	-4,938610E+02	3,546349E+23	1,412403E+09	2,704972E-01	6,831697E-03	1,065706E+07	-1,437162E+03
3	1,113842E+07	1,292370E-10	-1,166808E+03	4,042910E+23	1,711942E+09	1,106231E-01	0.	1,161947E+07	-3,464557E+02
4	1,240502E+07	3,081968E-11	-9,336110E+02	6,023609E+23	2,683649E+09	4,135460E-02	9,219499E-05	1,319006E+07	-1,470767E+03
5	1,397515E+07	1,151430E-11	5,726768E+03	6,655844E+23	4,313968E+09	2,483615E-02	0.	1,470023E+07	1,292430E+04
6	1,572359E+07	4,261840E-12	2,500680E+04	8,209567E+23	4,406933E+09	9,397542E-03	0.	1,666655E+07	3,708930E+04
7	1,790231E+07	2,094918E-12	4,202150E+04	1,043195E+24	6,096926E+09	6,390469E-03	0.	1,911807E+07	4,645369E+04
8	2,054070E+07	9,247775E-13	5,947015E+04	1,275940E+24	9,184464E+09	4,240792E-03	0.	2,206332E+07	7,198661E+04
9	2,441407E+07	3,580131E-13	9,910332E+04	2,235508E+24	1,258039E+10	2,251971E-03	0.	2,716474E+07	1,262200E+05
10	3,202587E+07	9,550653E-14	1,771235E+05	4,349459E+24	4,371756E+10	2,086968E-03	0.	3,688300E+07	2,280269E+05
11	4,652469E+07	2,315532E-14	2,702605E+05	9,012548E+24	6,771905E+10	7,730628E-04	0.	5,616638E+07	3,124940E+05
12	6,737958E+07	7,902504E-15	4,138492E+05	1,113096E+25	9,377692E+10	3,705363E-04	0.	7,854277E+07	5,151866E+05
13	9,007135E+07	2,829745E-15	6,477613E+05	1,214025E+25	1,000739E+11	1,415918E-04	0.	1,015499E+08	7,803362E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 120,0

KCYC= 4 TIMDEL= 2,000000E-03 TIMTOT= 9,800000E-02 TTX= 1,163800E+01 DSMALL= 8,996145E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,538446E+06	1,142836E-09	-1,125597E+02	4,502931E+23	1,358715E+09	7,763941E-01	0,	1,007689E+07	-2,251193E+02
2	1,081242E+07	2,368063E-10	-1,979543E+03	6,175323E+23	1,710650E+09	2,025463E-01	6,006222E-03	1,154794E+07	-3,733967E+03
3	1,281726E+07	4,095872E-11	4,678122E+03	1,072306E+24	2,660762E+09	5,449070E-02	0,	1,408659E+07	1,309021E+04
4	1,570180E+07	1,145624E-11	2,718297E+04	1,376650E+24	4,100044E+09	2,348554E-02	0,	1,731701E+07	4,127573E+04
5	1,950711E+07	3,050253E-12	6,111367E+04	1,888455E+24	4,819573E+09	7,350458E-03	0,	2,169721E+07	8,095162E+04
6	2,391538E+07	1,175379E-12	9,781148E+04	1,938427E+24	9,207609E+09	5,411215E-03	0,	2,613355E+07	1,140713E+05
7	2,881272E+07	3,374788E-13	1,373354E+05	2,376116E+24	2,287193E+10	3,859397E-03	0,	3,149190E+07	1,599994E+05
8	3,522589E+07	1,903872E-13	2,015214E+05	3,375731E+24	3,137154E+10	2,986371E-03	0,	3,895989E+07	2,430434E+05
9	4,378254E+07	1,168243E-13	3,047602E+05	4,471646E+24	4,023208E+10	2,350043E-03	0,	4,860519E+07	3,664769E+05
10	5,322825E+07	4,038349E-14	4,141101E+05	4,406334E+24	1,124198E+11	2,269952E-03	0,	5,785131E+07	4,617432E+05
11	6,282945E+07	4,262019E-14	4,952721E+05	4,877677E+24	8,209477E+10	1,749447E-03	0,	6,780759E+07	5,288010E+05
12	7,361866E+07	1,589870E-14	5,744719E+05	5,870717E+24	1,484209E+11	1,179850E-03	0,	7,942973E+07	6,201428E+05
13	8,543756E+07	1,382893E-14	6,411490E+05	6,273045E+24	1,321817E+11	9,139656E-04	0,	9,144539E+07	6,621552E+05

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 120,0

KCYC= 4 TIMDEL= 2,000000E-03 TIMTOT= 1,000000E-01 TTX= 1,164700E+01 DSMALL= 9,156763E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,435940E+06	7,944739E-10	-5,170434E+03	3,644536E+23	1,933730E+09	7,681491E-01	8,100981E-02	9,871880E+06	-1,034087E+04
2	1,077007E+07	3,264042E-10	-6,000625E+03	7,540014E+23	1,741985E+09	2,842956E-01	0,	1,166825E+07	-1,660382E+03
3	1,300401E+07	9,776412E-11	9,168414E+03	1,129079E+24	2,137299E+09	1,044756E-01	0,	1,433977E+07	1,999721E+04
4	1,605407E+07	2,651109E-11	3,455786E+04	1,462682E+24	3,444986E+09	4,566517E-02	0,	1,776837E+07	4,911852E+04
5	1,977922E+07	1,103750E-11	6,698114E+04	1,735329E+24	5,603383E+09	3,092368E-02	0,	2,179007E+07	8,484376E+04
6	2,407810E+07	5,630001E-12	1,030714E+05	2,000461E+24	7,353881E+09	2,070118E-02	0,	2,636613E+07	1,212990E+05
7	2,905909E+07	2,761500E-12	1,444758E+05	2,390107E+24	9,878347E+09	1,363953E-02	0,	3,175204E+07	1,676525E+05
8	3,518507E+07	1,202435E-12	2,001359E+05	3,103261E+24	1,612652E+10	9,695545E-03	0,	3,861810E+07	2,326193E+05
9	4,274353E+07	4,660000E-13	2,721258E+05	3,813485E+24	2,978553E+10	6,940027E-03	0,	4,686895E+07	3,116324E+05
10	5,161199E+07	2,413990E-13	3,521253E+05	4,499547E+24	4,180672E+10	5,046050E-03	0,	5,635503E+07	3,926183E+05
11	6,199257E+07	1,477817E-13	4,467766E+05	5,510596E+24	5,204096E+10	3,845352E-03	0,	6,763011E+07	5,009349E+05
12	7,418487E+07	9,468188E-14	5,709461E+05	6,632639E+24	6,486432E+10	3,070738E-03	0,	8,073964E+07	6,409573E+05
13	8,776971E+07	6,941632E-14	7,029460E+05	7,387942E+24	7,201242E+10	2,499419E-03	0,	9,479979E+07	7,649346E+05

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 120,0

KCYC= 4 TIMDEL= 3,000000E-03 TIMTOT= 1,030000E-01 TTX= 1,165700E+01 DSMALL= 6,334123E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTUP,CM/S
1	9,356716E+06	5,805702E-10	-5,693795E+03	2,981481E+23	2,691328E+09	7,812526E-01	8,234962E-02	9,713433E+06	-1,136759E+04
2	1,063777E+07	2,525691E-10	-1,017825E+04	7,756404E+23	1,892758E+09	2,390260E-01	0,	1,156211E+07	-8,966919E+03
3	1,294465E+07	1,482763E-10	3,415784E+03	1,168404E+24	1,897134E+09	1,406500E-01	0,	1,432718E+07	1,580049E+04
4	1,611779E+07	5,275477E-11	3,514495E+04	1,528053E+24	3,792481E+09	1,000357E-01	0,	1,790832E+07	5,446941E+04
5	2,004734E+07	1,392899E-11	7,568871E+04	1,847448E+24	1,002682E+10	6,983174E-02	0,	2,218637E+07	9,686801E+04
6	2,453847E+07	8,790080E-12	1,179647E+05	2,059350E+24	1,370529E+10	6,023531E-02	0,	2,689058E+07	1,390413E+05
7	2,953615E+07	6,897949E-12	1,606323E+05	2,351414E+24	1,379541E+10	4,758003E-02	0,	3,218172E+07	1,822232E+05
8	3,555362E+07	4,835454E-12	2,112293E+05	3,051348E+24	1,453965E+10	3,515339E-02	0,	3,892552E+07	2,402354E+05
9	4,299702E+07	2,146053E-12	2,761119E+05	3,766443E+24	2,512761E+10	2,696259E-02	0,	4,706852E+07	3,119884E+05
10	5,176151E+07	1,975681E-12	3,522870E+05	4,453993E+24	2,155949E+10	2,124733E-02	0,	5,645449E+07	3,925856E+05
11	6,190584E+07	1,047063E-12	4,421943E+05	5,327270E+24	2,983809E+10	1,562117E-02	0,	6,735720E+07	4,918030E+05
12	7,360055E+07	5,747989E-13	5,504101E+05	6,307138E+24	3,859720E+10	1,109281E-02	0,	7,984390E+07	6,090171E+05
13	8,678401E+07	3,443429E-13	6,695738E+05	7,273570E+24	4,723605E+10	8,132698E-03	0,	9,372412E+07	7,301304E+05

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,12E+02	4,12E+02	4,02E+04	5,94E+08	5,91E+03	3,34E+11	2,77E+13	7,33E+12	9,08E+07	1,00E+00	1,00E+00	1,07E+00	217,9	218,5
2	5,44E+02	5,44E+02	1,47E+05	6,13E+08	6,42E+04	3,96E+11	7,75E+12	1,90E+12	6,68E+07	1,00E+00	1,81E+00	5,11E-01	233,2	224,5
3	5,99E+02	5,99E+02	1,72E+05	2,90E+08	7,70E+04	3,00E+11	2,75E+12	5,95E+11	1,59E+08	1,00E+00	1,53E+01	1,29E-01	254,7	255,3
4	6,33E+02	6,33E+02	1,78E+05	1,68E+08	7,61E+04	1,33E+11	8,77E+11	1,71E+11	1,92E+08	1,00E+00	7,91E+01	5,23E-02	315,3	320,0
5	7,40E+02	7,40E+02	1,49E+05	1,19E+08	5,13E+04	4,47E+10	2,60E+11	4,81E+10	1,91E+08	1,00E+00	2,38E+02	2,16E-02	471,8	443,3
6	7,95E+02	7,95E+02	1,49E+05	8,85E+07	4,88E+04	2,50E+10	1,11E+11	1,85E+10	1,63E+08	1,00E+00	7,89E+02	1,31E-02	642,0	613,2
7	6,92E+02	6,92E+02	1,71E+05	4,27E+07	6,63E+04	1,62E+10	5,61E+10	8,56E+09	7,58E+07	1,00E+00	3,04E+03	8,74E-03	766,3	780,0
8	7,79E+02	7,79E+02	1,69E+05	3,01E+07	1,45E+05	8,15E+09	2,16E+10	2,97E+09	5,63E+07	1,48E+00	1,10E+04	4,11E-03	1007,2	909,9
9	9,33E+02	9,33E+02	4,80E+05	2,89E+07	2,05E+06	5,36E+09	1,04E+10	1,26E+09	3,73E+07	1,14E+01	2,68E+05	2,91E-03	1355,4	1233,5
10	1,81E+03	1,81E+03	3,51E+06	6,89E+07	1,51E+07	2,91E+09	3,67E+09	3,39E+08	2,64E+07	3,61E+02	3,12E+06	1,98E-03	1960,4	2011,2
11	2,85E+03	2,85E+03	4,81E+06	4,41E+07	1,09E+07	1,02E+09	7,79E+08	4,72E+07	6,31E+06	9,45E+04	4,46E+06	6,64E-04	2644,8	2479,7
12	4,51E+03	4,51E+03	1,42E+07	2,62E+07	3,69E+06	3,45E+08	1,37E+08	3,72E+06	6,32E+05	7,32E+06	6,80E+06	2,82E-04	3891,1	3636,1
13	4,86E+03	4,86E+03	1,02E+07	5,88E+06	1,22E+06	1,28E+08	2,33E+07	8,86E+05	1,92E+05	4,05E+06	6,09E+06	1,22E-04	5292,6	4857,8

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	U2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,61E+02	4,61E+02	4,13E+04	2,02E+09	6,94E+03	3,28E+11	2,69E+13	7,10E+12	1,77E+06	1,00E+00	1,00E+00	1,04E+00	220,5	220,0
2	6,31E+02	6,31E+02	1,49E+05	2,03E+09	5,57E+04	3,62E+11	7,00E+12	1,71E+12	1,03E+06	1,00E+00	1,84E+00	2,88E-01	238,8	229,4
3	6,28E+02	6,28E+02	1,73E+05	3,55E+08	7,37E+04	2,86E+11	2,61E+12	5,63E+11	1,28E+08	1,00E+00	1,56E+01	1,24E-01	256,4	259,4
4	7,40E+02	7,40E+02	1,67E+05	1,99E+08	5,53E+04	1,09E+11	7,02E+11	1,35E+11	1,91E+08	1,00E+00	8,25E+01	4,54E-02	350,8	346,5
5	8,91E+02	8,91E+02	1,44E+05	1,11E+08	4,14E+04	3,87E+10	2,14E+11	3,86E+10	2,75E+08	1,00E+00	2,57E+02	2,10E-02	558,7	520,5
6	8,43E+02	8,43E+02	1,54E+05	8,50E+07	5,13E+04	2,53E+10	1,08E+11	1,76E+10	2,20E+08	1,00E+00	8,62E+02	1,47E-02	723,8	701,7
7	8,20E+02	8,20E+02	1,59E+05	5,05E+07	5,21E+04	1,47E+10	4,92E+10	7,25E+09	1,32E+08	1,00E+00	2,97E+03	8,41E-03	899,0	853,5
8	9,77E+02	9,77E+02	1,62E+05	3,58E+07	7,22E+04	7,35E+09	1,88E+10	2,48E+09	1,04E+08	2,09E+00	9,96E+03	3,92E-03	1142,7	988,8
9	1,22E+03	1,22E+03	4,26E+05	4,16E+07	1,62E+06	4,66E+09	8,74E+09	9,91E+08	7,59E+07	1,87E+01	2,25E+05	2,68E-03	1623,4	1340,1
10	3,36E+03	3,36E+03	1,89E+06	1,42E+08	2,63E+07	2,39E+09	2,63E+09	1,30E+08	4,43E+07	1,33E+03	1,15E+06	2,35E-03	3186,8	3107,2
11	5,38E+03	5,38E+03	9,70E+06	1,00E+08	1,10E+07	6,93E+08	4,39E+08	4,36E+06	2,77E+06	6,63E+06	2,71E+06	6,67E-04	4098,9	[illegible]
12	6,02E+03	6,02E+03	2,37E+07	5,56E+07	5,75E+06	2,53E+08	7,72E+07	4,07E+05	1,10E+06	1,45E+07	9,10E+06	3,36E-04	6019,6	5437,6
13	6,24E+03	6,24E+03	1,44E+07	1,08E+07	1,81E+06	1,05E+08	1,53E+07	4,21E+05	9,88E+05	5,75E+06	8,58E+06	1,51E-04	7731,9	6687,3

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	UP	PRES	TEM(1)	TEM(2)
1	5,43E+02	5,43E+02	4,00E+04	8,54E+09	8,79E+03	3,09E+11	2,45E+13	6,48E+12	4,96E+05	1,00E+00	1,00E+00	9,61E-01	226,9	222,1
2	7,30E+02	7,30E+02	1,56E+05	5,14E+09	4,73E+04	3,30E+11	6,29E+12	1,54E+12	3,73E+05	1,00E+00	1,96E+00	2,71E-01	243,9	240,1
3	7,45E+02	7,45E+02	1,69E+05	9,02E+08	5,79E+04	2,39E+11	2,12E+12	4,54E+11	2,18E+07	1,00E+00	1,66E+01	1,11E-01	283,2	284,4
4	9,35E+02	9,35E+02	1,51E+05	1,71E+08	3,63E+04	8,51E+10	5,06E+11	9,44E+10	2,49E+08	1,00E+00	9,14E+01	4,15E-02	456,0	436,8
5	1,05E+03	1,05E+03	1,51E+05	2,16E+07	3,75E+04	3,77E+10	1,89E+11	3,23E+10	7,22E+08	1,00E+00	3,03E+02	2,49E-02	727,7	693,7
6	9,00E+02	9,00E+02	8,30E+04	1,70E+07	2,93E+04	1,74E+10	6,94E+10	1,07E+10	3,97E+08	1,00E+00	7,18E+02	9,43E-03	929,1	707,7
7	1,09E+03	1,09E+03	1,33E+05	1,42E+07	3,18E+04	1,09E+10	3,36E+10	4,52E+09	3,45E+08	1,00E+00	2,70E+03	6,42E-03	1055,4	943,9
8	1,56E+03	1,56E+03	1,71E+05	2,10E+07	6,09E+04	6,32E+09	1,44E+10	1,53E+09	2,66E+08	2,18E+00	8,48E+03	4,27E-03	1544,6	1373,3
9	2,23E+03	2,23E+03	2,00E+05	2,85E+07	5,36E+05	3,23E+09	5,29E+09	3,90E+08	2,33E+08	2,50E+01	4,14E+04	2,28E-03	2306,2	1815,8
10	7,19E+03	7,19E+03	4,19E+06	5,61E+08	5,58E+07	1,34E+09	1,04E+09	1,00E+00	2,04E+06	2,78E+06	1,13E+05	2,10E-03	5753,5	5047,6
11	6,81E+03	6,81E+03	1,73E+07	3,19E+08	5,39E+07	3,87E+08	1,13E+08	1,00E+00	3,24E+06	1,31E+07	3,55E+06	7,89E-04	6792,1	6161,7
12	7,74E+03	7,74E+03	3,26E+07	8,66E+07	1,91E+07	1,55E+08	1,73E+07	1,00E+00	1,70E+06	1,91E+07	1,33E+07	3,76E-04	9315,3	7897,0
13	7,89E+03	7,89E+03	1,61E+07	1,42E+07	3,55E+06	6,65E+07	4,81E+06	8,17E+04	2,10E+06	6,20E+06	9,83E+06	1,43E-04	10867,3	8586,1

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	7,08E+02	7,08E+02	4,77E+04	3,12E+10	1,08E+04	2,68E+11	1,88E+13	4,94E+12	9,66E+05	1,00E+00	1,00E+00	7,76E-01	243,3	234,4
2	8,98E+02	8,98E+02	1,59E+05	6,83E+09	3,61E+04	2,44E+11	3,89E+12	9,28E+11	2,16E+06	1,00E+00	3,36E+00	2,03E-01	286,6	289,4
3	1,13E+03	1,13E+03	1,09E+05	4,18E+01	2,29E+04	9,93E+10	6,73E+11	1,32E+11	2,54E+09	1,00E+00	3,18E+01	5,59E-02	493,8	437,3
4	1,31E+03	1,31E+03	1,03E+05	7,92E+03	1,67E+04	4,11E+10	1,88E+11	2,98E+10	3,89E+09	1,00E+00	1,67E+02	2,35E-02	745,3	653,3
5	1,28E+03	1,28E+03	6,94E+04	6,28E+03	9,30E+03	1,38E+10	4,96E+10	6,64E+09	1,88E+09	1,00E+00	5,89E+02	7,35E-03	917,8	753,4
6	2,08E+03	2,08E+03	1,16E+05	8,41E+05	1,01E+00	7,65E+09	1,67E+10	1,61E+09	1,57E+09	1,00E+00	2,01E+03	5,43E-03	1530,4	1350,2
7	5,51E+03	5,51E+03	7,72E+05	3,14E+08	2,23E+07	3,64E+09	5,08E+09	1,00E+00	2,17E+07	7,74E+02	1,87E+03	3,89E-03	3619,9	3097,8
8	6,46E+03	6,46E+03	6,27E+05	8,71E+08	1,62E+07	2,27E+09	2,59E+09	1,00E+00	3,51E+07	2,48E+03	2,70E+03	3,14E-03	4718,3	3802,3
9	7,93E+03	7,93E+03	2,48E+06	1,09E+09	2,09E+07	1,57E+09	1,37E+09	1,00E+00	3,16E+07	1,08E+06	7,99E+04	2,61E-03	5548,2	4279,1
10	9,00E+03	9,00E+03	2,60E+08	8,05E+08	1,89E+08	4,79E+08	1,23E+06	1,00E+00	1,80E+04	2,03E+08	5,36E+07	2,27E-03	9763,9	8317,6
11	7,20E+03	7,20E+03	2,73E+08	8,49E+08	2,00E+08	5,06E+08	1,49E+06	1,00E+00	2,17E+01	2,15E+08	5,67E+07	1,76E-03	6496,9	5691,9
12	1,05E+04	1,05E+04	1,93E+08	2,21E+08	6,12E+07	1,93E+08	1,80E+05	1,00E+00	3,82E+03	1,36E+08	5,67E+07	1,18E-03	11917,2	10210,8
13	9,40E+03	9,40E+03	1,98E+08	1,62E+08	4,75E+07	1,70E+08	6,67E+04	1,00E+00	5,03E+02	1,36E+08	6,10E+07	9,15E-04	9251,3	8203,2

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	1,03E+03	1,03E+03	6,00E+04	3,94E+09	3,86E+03	3,07E+11	1,30E+13	3,30E+12	2,57E+07	1,00E+00	1,00E+00	7,69E-01	310,6	332,6
2	1,11E+03	1,11E+03	7,76E+04	1,66E+01	1,25E+04	2,13E+11	5,36E+12	1,34E+12	1,20E+09	1,00E+00	1,00E+00	2,87E-01	326,7	298,2
3	1,28E+03	1,28E+03	6,23E+04	5,86E+03	7,31E+03	1,20E+11	1,60E+12	3,73E+11	3,01E+10	1,00E+00	2,38E+00	1,04E-01	410,8	359,2
4	1,72E+03	1,72E+03	5,49E+04	3,35E+03	2,51E+03	7,71E+10	4,33E+11	7,67E+10	4,18E+10	1,00E+00	1,76E+01	4,57E-02	636,1	539,9
5	1,99E+03	1,99E+03	5,64E+04	2,30E+03	6,82E+02	4,89E+10	1,80E+11	2,28E+10	3,15E+10	1,00E+00	6,19E+01	3,09E-02	957,4	821,2
6	2,14E+03	2,14E+03	6,16E+04	4,00E+03	1,00E+00	3,15E+10	9,13E+10	8,12E+09	2,10E+10	1,00E+00	1,57E+02	2,07E-02	1184,0	1027,3
7	2,76E+03	2,76E+03	8,88E+04	9,79E+03	6,15E+03	1,85E+10	4,48E+10	2,81E+09	9,34E+09	1,00E+00	2,42E+02	1,36E-02	1598,2	1362,8
8	4,30E+03	4,30E+03	2,55E+06	6,98E+08	2,74E+07	1,20E+10	2,02E+10	3,89E+08	8,64E+08	2,44E+01	3,09E+02	1,49E-02	2512,3	2115,2
9	7,87E+03	7,87E+03	1,07E+08	6,08E+09	7,53E+08	4,40E+09	4,40E+09	1,00E+00	1,00E+00	9,36E+07	1,92E+06	7,11E-03	3776,3	3167,1
10	5,91E+03	5,91E+03	7,58E+08	6,62E+09	1,07E+09	1,58E+09	2,90E+00	1,00E+00	1,00E+00	4,52E+08	3,01E+08	5,07E-03	3806,7	3206,0
11	4,80E+03	4,80E+03	1,77E+09	3,38E+09	2,23E+08	7,90E+08	1,22E+00	1,00E+00	1,00E+00	1,16E+09	6,09E+08	3,87E-03	3790,1	3113,4
12	4,85E+03	4,85E+03	1,75E+09	1,66E+09	7,37E+07	4,86E+08	1,07E+00	1,00E+00	1,00E+00	1,18E+09	5,67E+08	3,09E-03	4485,6	3601,5
13	4,87E+03	4,87E+03	1,51E+09	1,01E+09	4,74E+07	3,55E+08	1,03E+00	1,00E+00	1,00E+00	1,03E+09	4,78E+08	2,51E-03	4546,8	3698,9

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	1,40E+03	1,40E+03	5,86E+04	4,15E+03	6,47E+03	3,63E+11	9,53E+12	2,39E+12	2,80E+10	1,00E+00	1,00E+00	7,81E-01	367,8	459,2
2	1,42E+03	1,42E+03	2,83E+04	1,43E+03	2,16E+03	1,66E+11	4,14E+12	1,04E+12	3,58E+10	1,00E+00	1,00E+00	2,39E-01	359,4	323,2
3	1,52E+03	1,52E+03	3,01E+04	4,10E+03	5,59E+03	1,43E+11	2,43E+12	5,83E+11	8,08E+10	1,00E+00	1,00E+00	1,41E-01	377,1	319,3
4	1,97E+03	1,97E+03	4,95E+04	8,26E+03	1,32E+04	1,35E+11	8,62E+11	1,61E+11	1,29E+11	1,00E+00	4,79E+00	1,00E-01	706,9	586,5
5	2,53E+03	2,53E+03	1,33E+05	1,54E+04	3,91E+04	8,26E+10	2,34E+11	2,72E+10	2,33E+10	1,00E+00	1,76E+01	6,98E-02	1709,2	1418,7
6	3,06E+03	3,06E+03	1,85E+05	1,00E+00	1,00E+00	8,50E+10	1,52E+11	6,42E+09	5,39E+09	1,00E+00	3,41E+01	6,02E-02	2076,3	1774,6
7	3,37E+03	3,37E+03	2,50E+05	2,08E+08	6,79E+05	8,25E+10	1,21E+11	1,00E+00	1,28E+08	1,00E+00	3,83E+01	4,77E-02	1974,4	1698,3
8	3,60E+03	3,60E+03	1,17E+06	4,44E+09	1,50E+07	6,22E+10	8,28E+10	1,00E+00	8,82E+05	5,30E+01	5,25E+01	3,53E-02	2020,6	1716,5
9	4,81E+03	4,81E+03	2,69E+06	1,09E+10	3,92E+07	3,63E+10	3,19E+10	1,00E+00	1,00E+00	4,04E+02	1,12E+02	2,70E-02	2947,2	2488,2
10	5,12E+03	5,12E+03	1,17E+07	1,40E+10	6,86E+08	3,21E+10	2,70E+10	1,00E+00	1,00E+00	1,17E+06	5,97E+04	2,13E-02	2486,2	2105,3
11	8,00E+03	8,00E+03	4,26E+07	2,51E+10	4,32E+09	1,10E+10	3,20E+09	1,00E+00	1,00E+00	1,83E+07	8,80E+05	1,56E-02	3106,6	2598,5
12	5,22E+03	5,22E+03	2,61E+09	1,66E+10	1,83E+09	3,51E+09	4,44E+00	1,00E+00	1,00E+00	1,01E+09	1,59E+09	1,12E-02	3315,2	2734,5
13	4,86E+03	4,86E+03	3,41E+09	9,05E+09	5,39E+08	1,61E+09	1,81E+00	1,00E+00	1,00E+00	1,84E+09	1,57E+09	8,22E-03	3622,5	2971,9

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 120,00

COLUMN (3, 1) = 3

	HC O2 (HTOP)O	RHO ENO HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2VIB	EN2D CO2	D	N2 GAMB
K = 1	9,500E+06 5,546E+12 9,834E+06	1,284E-09 4,728E+05 1,250E+09	5,608E+02 1,000E+00 6,194E+04	6,194E+04 1,181E+00 2,235E+02	1,527E+02 8,318E-01	3,054E+02 0,	7,895E+09 5,608E+02	1,607E+04 8,647E+09	3,132E+11 IIII	2,108E+13 1,101E+03
K = 2	1,075E+07 9,283E+11 1,087E+07	2,404E-10 1,241E+07 2,338E+08	7,343E+02 1,000E+00 1,630E+05	1,630E+05 1,021E+01 2,283E+02	-1,416E+02 1,625E-01	-5,886E+02 1,491E-03	2,760E+09 7,343E+02	5,322E+04 1,535E+09	2,792E+11 IIII	3,946E+12 4,340E+03
K = 3	1,250E+07 1,063E+11 1,186E+07	3,371E-11 3,086E+08 3,291E+07	9,061E+02 1,000E+00 1,519E+05	1,520E+05 1,198E+02 3,899E+02	3,910E+02 4,023E-02	1,371E+03 0,	1,913E+08 9,061E+02	3,780E+04 1,464E+08	8,695E+10 IIII	5,535E+11 3,377E+03
K = 4	1,475E+07 2,154E+10 1,308E+07	7,912E-12 5,605E+08 1,042E+07	1,016E+03 1,000E+00 1,165E+05	1,170E+05 5,091E+02 6,542E+02	1,492E+04 1,619E-02	2,848E+04 0,	1,929E+07 1,016E+03	3,344E+04 1,579E+07	2,761E+10 IIII	1,245E+11 2,714E+03
K = 5	1,750E+07 5,920E+09 1,464E+07	2,593E-12 3,571E+08 7,931E+06	1,025E+03 1,000E+00 1,191E+05	1,213E+05 2,251E+03 8,261E+02	3,748E+04 6,888E-03	4,647E+04 0,	1,485E+07 1,025E+03	3,124E+04 3,183E+06	1,235E+10 IIII	4,175E+10 2,756E+03
K = 6	2,075E+07 1,489E+09 1,652E+07	8,931E-13 2,647E+08 6,054E+06	1,565E+03 5,002E+00 1,623E+05	1,747E+05 1,241E+04 1,386E+03	6,155E+04 4,163E-03	7,663E+04 0,	2,173E+07 1,565E+03	1,195E+05 6,488E+05	6,086E+09 IIII	1,388E+10 3,528E+03
K = 7	2,450E+07 3,905E+08 1,856E+07	3,580E-13 2,333E+08 4,634E+06	2,234E+03 2,500E+01 1,680E+05	2,095E+05 4,140E+04 1,834E+03	9,787E+04 2,325E-03	1,191E+05 0,	2,853E+07 2,234E+03	5,365E+05 1,584E+05	3,234E+09 IIII	5,294E+09 4,174E+03
K = 8	2,900E+07 5,189E+07 2,051E+07	1,304E-13 3,277E+07 2,615E+06	5,121E+03 2,414E+06 1,140E+06	3,657E+06 1,036E+05 4,109E+03	1,454E+05 2,173E-03	1,716E+05 0,	4,907E+08 5,121E+03	4,847E+07 3,861E+04	1,591E+09 IIII	1,605E+09 3,621E+03
K = 9	3,450E+07 1,000E+00 2,267E+07	8,806E-14 2,164E+06 2,178E+06	7,167E+03 3,851E+06 1,228E+06	5,549E+06 4,697E+05 4,605E+03	2,012E+05 1,777E-03	2,307E+05 0,	5,363E+08 7,167E+03	5,562E+07 1,835E+04	1,241E+09 IIII	9,433E+08 3,342E+03
K =10	4,100E+07 1,000E+00 2,455E+07	2,316E-14 3,240E+06 1,067E+06	6,809E+03 1,308E+07 7,073E+05	1,734E+07 3,553E+06 9,146E+03	2,461E+05 1,146E-03	2,614E+05 0,	3,188E+08 6,809E+03	5,394E+07 1,851E+03	3,870E+08 IIII	1,133E+08 1,663E+03
K =11	4,850E+07 1,000E+00 2,671E+07	2,316E-14 3,240E+06 1,067E+06	6,809E+03 1,308E+07 7,073E+05	1,734E+07 3,553E+06 5,826E+03	2,789E+05 7,360E-04	2,964E+05 0,	3,188E+08 6,809E+03	5,394E+07 1,851E+03	3,870E+08 IIII	1,133E+08 1,663E+03
K =12	5,700E+07 1,000E+00 2,936E+07	1,407E-14 2,324E+06 8,750E+05	7,154E+03 1,665E+07 4,080E+05	2,645E+07 9,383E+06 6,841E+03	3,286E+05 5,440E-04	3,607E+05 0,	1,805E+08 7,154E+03	3,317E+07 8,535E+02	2,490E+08 IIII	5,610E+07 9,490E+02
K =13	6,650E+07 1,000E+00 3,249E+07	7,903E-15 1,702E+06 7,446E+05	7,745E+03 1,908E+07 2,050E+05	3,262E+07 1,334E+07 8,166E+03	4,059E+05 3,881E-04	4,511E+05 0,	8,662E+07 7,745E+03	1,907E+07 1,769E+02	1,553E+08 IIII	1,727E+07 4,648E+02

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 150.0

KCYC= 3 TIMDEL= 2.000000E-03 TIMTOT= 1.050000E-01 TTX= 1.181700E+01 DSMALL= 1.096777E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9.365098E+06	1.660203E-09	2.659688E+02	3.051617E+23	1.254173E+09	1.041091E+00	0.	9.730197E+06	5.319376E+02
2	1.005027E+07	5.069640E-10	-8.977439E+02	2.680918E+23	1.366634E+09	3.464172E-01	1.103578E-02	1.037033E+07	-2.327425E+03
3	1.074977E+07	1.640436E-10	-2.291496E+03	3.185090E+23	1.518981E+09	1.245846E-01	0.	1.112921E+07	-2.255567E+03
4	1.157388E+07	5.455168E-11	-1.591339E+03	3.742094E+23	1.978141E+09	5.395546E-02	0.	1.201854E+07	-5.271111E+02
5	1.257160E+07	1.641540E-11	-3.108133E+03	4.668627E+23	2.781397E+09	2.282887E-02	8.362835E-04	1.312466E+07	-5.689154E+03
6	1.380356E+07	6.086412E-12	-4.464789E+03	5.752633E+23	3.641654E+09	1.108230E-02	0.	1.448245E+07	-3.240424E+03
7	1.534306E+07	2.988396E-12	4.102117E+03	7.326935E+23	4.594879E+09	6.865600E-03	0.	1.620367E+07	1.144466E+04
8	1.715734E+07	1.443036E-12	8.167746E+03	8.164438E+23	6.082807E+09	4.388653E-03	1.593057E-04	1.811102E+07	4.890833E+03
9	1.978987E+07	5.523918E-13	1.410815E+04	1.448865E+24	7.420576E+09	2.044533E-03	0.	2.146872E+07	2.332546E+04
10	2.358173E+07	2.253308E-13	4.364058E+04	1.844670E+24	1.338297E+10	1.507797E-03	0.	2.569474E+07	6.395570E+04
11	2.934630E+07	6.433632E-14	6.548307E+04	3.243711E+24	1.918312E+10	6.170855E-04	0.	3.299785E+07	6.701044E+04
12	3.947870E+07	1.482469E-14	9.100222E+04	5.933510E+24	3.145081E+10	2.331243E-04	0.	4.595954E+07	1.149940E+05
13	5.455089E+07	4.179147E-15	1.587338E+05	8.220296E+24	4.490875E+10	9.384015E-05	0.	6.314224E+07	2.024737E+05

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 150.0

KCYC= 4 TIMDEL= 2.000000E-03 TIMTOT= 1.070000E-01 TTX= 1.182600E+01 DSMALL= 1.030060E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9.379126E+06	1.598705E-09	-1.384068E+02	3.169004E+23	1.259056E+09	1.006430E+00	1.646367E-03	9.758252E+06	-2.760136E+02
2	1.006686E+07	4.937289E-10	-1.391638E+03	2.752784E+23	1.449987E+09	3.579502E-01	9.552248E-03	1.041548E+07	-2.506463E+03
3	1.084509E+07	1.448415E-10	-3.133743E+03	3.607347E+23	1.488169E+09	1.077743E-01	7.678979E-04	1.127471E+07	-3.761024E+03
4	1.179043E+07	4.700366E-11	-3.992715E+03	4.343013E+23	2.229228E+09	5.239094E-02	3.381694E-04	1.230616E+07	-4.224407E+03
5	1.299827E+07	1.310007E-11	-5.920435E+03	5.850149E+23	3.234269E+09	2.118458E-02	4.905335E-04	1.369039E+07	-7.616463E+03
6	1.453741E+07	4.867376E-12	-8.211818E+02	7.193382E+23	3.746462E+09	9.117719E-03	0.	1.538442E+07	5.974099E+03
7	1.637646E+07	2.584280E-12	1.385249E+04	8.472683E+23	5.017944E+09	6.483887E-03	0.	1.736851E+07	2.173088E+04
8	1.852772E+07	1.182212E-12	2.075663E+04	9.965707E+23	6.421679E+09	3.795892E-03	3.472685E-05	1.968693E+07	1.978239E+04
9	2.172716E+07	4.518783E-13	3.141182E+04	1.771143E+24	7.948258E+09	1.795823E-03	0.	2.376739E+07	4.304125E+04
10	2.710176E+07	1.412835E-13	8.633184E+04	2.942034E+24	1.968918E+10	1.390878E-03	0.	3.043614E+07	1.290224E+05
11	3.632814E+07	3.904914E-14	1.351945E+05	5.344251E+24	3.084132E+10	6.021634E-04	0.	4.222015E+07	1.407666E+05
12	5.141955E+07	1.008439E-14	1.935379E+05	8.722637E+24	4.968064E+10	2.504995E-04	0.	6.061895E+07	2.463093E+05
13	7.117954E+07	3.242017E-15	3.233884E+05	1.059644E+25	6.203194E+10	1.005543E-04	0.	8.174013E+07	4.004675E+05

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 150.0

KCYC= 3 TIMDEL= 1.000000E-03 TIMTOT= 1.080000E-01 TTX= 1.183500E+01 DSMALL= 1.145888E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTOP,CM/S
1	9.474499E+06	1.353344E-09	-1.741271E+03	3.967369E+23	1.329699E+09	8.997697E-01	2.961669E-02	9.948998E+06	-3.482541E+03
2	1.063716E+07	2.620930E-10	-6.973226E+03	5.774572E+23	1.412375E+09	1.850867E-01	1.325323E-02	1.132533E+07	-1.046391E+04
3	1.235086E+07	3.288271E-11	-9.779781E+03	8.651124E+23	2.357549E+09	3.876129E-02	0.	1.337639E+07	-9.095651E+03
4	1.504203E+07	5.932572E-12	3.988684E+03	1.416757E+24	3.503524E+09	1.039245E-02	0.	1.670766E+07	1.707302E+04
5	1.845514E+07	2.219171E-12	2.536911E+04	1.501966E+24	4.899868E+09	5.436823E-03	0.	2.020261E+07	3.366519E+04
6	2.246575E+07	6.870450E-13	5.215597E+04	1.969058E+24	8.099985E+09	2.782527E-03	0.	2.472888E+07	7.064675E+04
7	2.723413E+07	2.834621E-13	8.402774E+04	2.211343E+24	1.147016E+10	1.625678E-03	0.	2.973938E+07	9.740873E+04
8	3.313409E+07	9.487938E-14	1.299910E+05	3.049929E+24	2.802412E+10	1.329456E-03	0.	3.652861E+07	1.625733E+05
9	4.063209E+07	6.322286E-14	2.038873E+05	3.769490E+24	3.368383E+10	1.064794E-03	0.	4.473537E+07	2.452013E+05
10	4.884904E+07	1.925267E-14	2.720569E+05	3.871232E+24	8.986020E+10	8.650244E-04	0.	5.296272E+07	2.989125E+05
11	5.728305E+07	2.089955E-14	3.056281E+05	4.166299E+24	6.030392E+10	6.301623E-04	0.	6.160337E+07	3.123436E+05
12	6.711543E+07	1.115769E-14	3.462696E+05	5.467182E+24	6.838325E+10	3.814994E-04	0.	7.262749E+07	3.801955E+05
13	7.895807E+07	6.026184E-15	4.199307E+05	6.492042E+24	8.491566E+10	2.558587E-04	0.	8.528865E+07	4.596660E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 150,0

KCYC= 3 TIMDEL= 2,000000E-03 TIMTOT= 1,100000E-01 TTX= 1,184400E+01 DSMALL= 1,137862E+01

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,486843E+06	1,264173E-09	-3,027258E+03	4,070734E+23	1,428761E+09	9,031005E-01	5,383088E-02	9,973686E+06	-6,054517E+03
2	1,065180E+07	2,569824E-10	-8,017790E+03	5,690490E+23	1,784733E+09	2,293225E-01	8,571726E-03	1,132991E+07	-9,981062E+03
3	1,279340E+07	3,551412E-11	-5,966222E+03	1,236699E+24	2,534662E+09	4,500813E-02	0,	1,425796E+07	-1,951361E+03
4	1,633236E+07	8,903090E-12	1,419904E+04	1,771433E+24	3,583962E+09	1,595417E-02	0,	1,840676E+07	3,034946E+04
5	2,110367E+07	2,465036E-12	4,468820E+04	2,336787E+24	4,306183E+09	5,307448E-03	0,	2,380057E+07	5,902693E+04
6	2,657854E+07	9,310045E-13	7,936111E+04	2,447234E+24	8,167448E+09	3,801965E-03	0,	2,935651E+07	9,969529E+04
7	3,272923E+07	2,649551E-13	1,235671E+05	3,026509E+24	2,025552E+10	2,683401E-03	0,	3,610195E+07	1,474369E+05
8	4,107505E+07	1,404938E-13	1,883927E+05	4,574551E+24	2,802653E+10	1,968777E-03	0,	4,604815E+07	2,293465E+05
9	5,271944E+07	8,227655E-14	2,903293E+05	6,349283E+24	3,680221E+10	1,513980E-03	0,	5,939074E+07	3,513120E+05
10	6,561190E+07	2,896102E-14	4,086487E+05	6,144228E+24	9,397813E+10	1,360851E-03	0,	7,183306E+07	4,659853E+05
11	7,798280E+07	3,305359E-14	5,116080E+05	6,289408E+24	7,191580E+10	1,186538E-03	0,	8,413253E+07	5,572307E+05
12	9,119169E+07	1,246330E-14	5,926615E+05	7,488927E+24	1,304797E+11	8,131038E-04	0,	9,825124E+07	6,280924E+05
13	1,045036E+08	1,261370E-14	6,246027E+05	6,877400E+24	1,262080E+11	7,959753E-04	0,	1,107559E+08	6,211130E+05

FOR COLUMN 5 REZONE NUMBER 3 REQUIRED AT TIME 1,500000E+02

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 150,0

KCYC= 4 TIMDEL= 2,000000E-03 TIMTOT= 1,120000E-01 TTX= 1,185400E+01 DSMALL= 7,407298E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,309510E+06	1,119443E-09	-1,054534E+03	2,586545E+23	2,306409E+09	1,290946E+00	4,623274E-02	9,619020E+06	-2,109067E+03
2	1,050289E+07	3,319638E-10	-9,466078E+03	7,413735E+23	1,771159E+09	2,939804E-01	3,544120E-02	1,138676E+07	-1,682309E+04
3	1,302274E+07	7,981876E-11	-7,997324E+03	1,382925E+24	1,923213E+09	7,675424E-02	0,	1,465872E+07	8,284414E+02
4	1,678800E+07	2,129641E-11	1,403516E+04	1,820837E+24	3,072821E+09	3,272003E-02	0,	1,891728E+07	2,724168E+04
5	2,148027E+07	6,615022E-12	4,605199E+04	2,223291E+24	4,920238E+09	2,119398E-02	0,	2,404326E+07	6,486209E+04
6	2,689430E+07	4,479951E-12	8,417587E+04	2,514000E+24	6,526117E+09	1,461834E-02	0,	2,974534E+07	1,034897E+05
7	3,304768E+07	2,225187E-12	1,216513E+05	2,966168E+24	8,825613E+09	9,819321E-03	0,	3,635002E+07	1,398129E+05
8	4,103971E+07	8,650870E-13	1,892196E+05	4,313402E+24	2,076186E+10	8,980407E-03	0,	4,572941E+07	2,386263E+05
9	5,092076E+07	3,615648E-13	2,711216E+05	4,914980E+24	2,668948E+10	4,824988E-03	0,	5,611211E+07	3,030170E+05
10	6,206937E+07	1,864887E-13	3,443262E+05	5,824406E+24	3,669562E+10	3,421659E-03	0,	6,802663E+07	3,850353E+05
11	7,528086E+07	1,106008E-13	4,387045E+05	7,363106E+24	4,495532E+10	2,486047E-03	0,	8,253509E+07	4,923736E+05
12	9,117907E+07	6,848468E-14	5,610042E+05	9,169799E+24	5,487588E+10	1,879079E-03	0,	9,982305E+07	6,296348E+05
13	1,083686E+08	5,399300E-14	6,671225E+05	9,498338E+24	6,335893E+10	1,710469E-03	0,	1,169141E+08	7,046103E+05

FOR COLUMN 6 REZONE NUMBER 3 REQUIRED AT TIME 1,500000E+02

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 150,0

KCYC= 5 TIMDEL= 3,000000E-03 TIMTOT= 1,150000E-01 TTX= 1,186400E+01 DSMALL= 6,410183E+00

K	CEN, ALT,,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E,,ERG/G	PRESS,,D/CM2	Q,D/CM2	TOP ALT,,CM	VTOP,CM/S
1	9,322652E+06	6,419324E-10	3,080003E+03	2,696482E+23	2,834168E+09	9,096722E-01	0,	9,645304E+06	6,160006E+03
2	1,032438E+07	3,441247E-10	-9,664843E+03	5,692785E+23	2,244080E+09	3,861217E-01	1,715890E-01	1,100345E+07	-2,548969E+04
3	1,272085E+07	1,194472E-10	-1,697725E+04	1,450403E+24	1,695836E+09	1,012815E-01	0,	1,443824E+07	-8,464802E+03
4	1,683055E+07	3,939924E-11	1,268943E+04	2,046031E+24	3,253463E+09	6,409199E-02	0,	1,922286E+07	3,264365E+04
5	2,199007E+07	1,070354E-11	5,341145E+04	2,404167E+24	8,717332E+09	4,676020E-02	0,	2,475728E+07	7,417924E+04
6	2,777182E+07	6,791924E-12	9,712712E+04	2,665202E+24	1,198011E+10	4,068400E-02	0,	3,078637E+07	1,200750E+05
7	3,409339E+07	5,443557E-12	1,426898E+05	2,979657E+24	1,221882E+10	3,325693E-02	0,	3,740042E+07	1,653046E+05
8	4,164169E+07	3,775617E-12	1,942721E+05	3,907879E+24	1,284467E+10	2,424827E-02	0,	4,588296E+07	2,232396E+05
9	5,102999E+07	1,658199E-12	2,590673E+05	4,874557E+24	2,196262E+10	1,820919E-02	0,	5,617701E+07	2,948950E+05
10	6,209812E+07	1,519925E-12	3,364865E+05	5,789542E+24	1,884426E+10	1,432093E-02	0,	6,801923E+07	3,780780E+05
11	7,498982E+07	7,890319E-13	4,296260E+05	7,069404E+24	2,603785E+10	1,027235E-02	0,	8,196041E+07	4,811739E+05
12	8,996669E+07	4,282737E-13	5,399378E+05	8,464999E+24	3,344529E+10	7,161869E-03	0,	9,797297E+07	5,987018E+05
13	1,064917E+08	2,658556E-13	6,423356E+05	9,420913E+24	4,170635E+10	5,543933E-03	0,	1,150104E+08	6,859695E+05

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,01E+02	4,01E+02	3,80E+04	5,50E+08	6,53E+03	3,29E+11	2,73E+13	7,21E+12	5,64E+07	1,00E+00	1,00E+00	1,04E+00	218,5	216,6
2	5,34E+02	5,34E+02	1,63E+05	6,32E+08	7,45E+04	4,25E+11	8,32E+12	2,04E+12	4,07E+07	1,00E+00	1,97E+00	3,46E-01	224,5	232,6
3	5,97E+02	5,97E+02	1,07E+05	2,53E+08	7,04E+04	2,93E+11	2,69E+12	5,82E+11	1,28E+08	1,00E+00	1,51E+01	1,25E-01	255,6	252,6
4	6,33E+02	6,33E+02	1,79E+05	1,47E+08	8,29E+04	1,30E+11	8,96E+11	1,74E+11	1,67E+08	1,00E+00	7,92E+01	5,40E-02	320,5	323,9
5	7,40E+02	7,40E+02	1,68E+05	1,05E+08	5,41E+04	4,64E+10	2,69E+11	4,99E+10	1,74E+08	1,00E+00	2,57E+02	2,22E-02	444,1	452,6
6	7,95E+02	7,95E+02	1,39E+05	6,72E+07	4,00E+04	2,24E+10	9,91E+10	1,65E+10	1,54E+08	1,00E+00	7,68E+02	1,11E-02	614,7	[illegible]
7	6,92E+02	6,92E+02	1,40E+05	3,29E+07	5,75E+04	1,39E+10	4,79E+10	7,31E+09	7,47E+07	1,00E+00	2,63E+03	6,87E-03	780,9	720,5
8	7,79E+02	7,79E+02	1,98E+05	2,92E+07	1,21E+05	8,52E+09	2,26E+10	3,10E+09	5,60E+07	1,51E+00	1,22E+04	4,39E-03	907,7	927,7
9	9,33E+02	9,33E+02	5,00E+05	2,17E+07	1,01E+06	4,27E+09	6,25E+09	1,00E+09	3,78E+07	9,70E+00	1,22E+05	2,06E-03	1234,8	[illegible]
10	1,81E+03	1,81E+03	2,04E+06	5,53E+07	1,01E+07	2,44E+09	3,07E+09	2,79E+08	2,89E+07	2,94E+02	1,74E+06	1,53E-03	2037,3	1660,0
11	2,88E+03	2,88E+03	3,88E+06	4,29E+07	9,87E+06	9,76E+08	7,42E+08	4,41E+07	6,67E+06	3,44E+04	3,60E+06	6,22E-04	2499,0	2436,7
12	4,41E+03	4,41E+03	1,17E+07	2,45E+07	3,14E+06	3,07E+08	1,20E+08	2,84E+06	5,70E+05	5,92E+06	5,70E+06	2,37E-04	3704,9	3476,9
13	4,59E+03	4,59E+03	8,44E+06	5,22E+06	9,74E+05	1,08E+08	1,95E+07	6,92E+05	1,79E+05	3,34E+06	5,08E+06	9,43E-05	4866,4	4460,1

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,47E+02	4,47E+02	3,90E+04	1,97E+09	6,07E+03	3,21E+11	2,63E+13	6,94E+12	6,37E+05	1,00E+00	1,00E+00	1,01E+00	220,0	217,5
2	6,24E+02	6,24E+02	1,80E+05	2,35E+09	7,45E+04	4,19E+11	8,11E+12	1,96E+12	5,21E+05	1,00E+00	2,10E+00	3,58E-01	229,3	246,6
3	6,26E+02	6,26E+02	1,55E+05	2,93E+08	6,48E+04	2,61E+11	2,38E+12	5,13E+11	9,74E+07	1,00E+00	1,46E+01	1,06E-01	259,6	247,6
4	7,39E+02	7,39E+02	1,88E+05	1,88E+08	7,19E+04	1,20E+11	7,72E+11	1,49E+11	1,61E+08	1,00E+00	8,84E+01	5,25E-02	347,3	364,3
5	8,91E+02	8,91E+02	1,61E+05	8,56E+07	3,94E+04	3,90E+10	2,15E+11	3,86E+10	2,53E+08	1,00E+00	2,75E+02	2,12E-02	522,9	523,5
6	8,43E+02	8,43E+02	1,07E+05	4,76E+07	3,01E+04	1,86E+10	7,92E+10	1,24E+10	2,09E+08	1,00E+00	7,19E+02	9,15E-03	703,6	600,3
7	8,20E+02	8,20E+02	1,38E+05	3,58E+07	4,63E+04	1,24E+10	4,14E+10	6,11E+09	1,29E+08	1,00E+00	2,76E+03	6,50E-03	854,8	785,7
8	9,77E+02	9,77E+02	1,92E+05	3,11E+07	7,61E+04	7,20E+09	1,85E+10	2,42E+09	1,02E+08	2,03E+00	1,10E+04	3,81E-03	985,0	974,5
9	1,22E+03	1,22E+03	2,78E+05	2,89E+07	8,51E+05	3,59E+09	6,74E+09	7,62E+08	7,51E+07	1,59E+01	1,02E+05	1,81E-03	1336,7	1164,0
10	3,37E+03	3,37E+03	8,27E+05	9,31E+07	1,55E+07	1,71E+09	1,88E+09	8,67E+07	4,39E+07	9,92E+02	4,44E+05	1,42E-03	3168,4	2659,3
11	5,32E+03	5,32E+03	7,68E+06	9,65E+07	1,00E+07	6,50E+08	4,10E+08	3,45E+06	2,38E+06	5,34E+06	1,99E+06	6,09E-04	3783,9	3657,9
12	5,61E+03	5,61E+03	1,87E+07	4,79E+07	4,31E+06	2,09E+08	6,31E+07	2,34E+05	7,81E+05	1,15E+07	7,13E+06	2,55E-04	5496,4	4976,3
13	5,67E+03	5,67E+03	1,08E+07	8,85E+06	1,33E+06	8,12E+07	1,17E+07	2,89E+05	8,71E+05	4,28E+06	6,52E+06	1,01E-04	6653,5	5813,2

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,94E+02	5,94E+02	7,78E+04	8,31E+09	1,00E+04	3,30E+11	2,22E+13	5,85E+12	4,89E+05	1,00E+00	1,00E+00	9,00E-01	223,5	224,4
2	7,29E+02	7,29E+02	1,79E+05	3,00E+09	6,67E+04	3,04E+11	4,30E+12	1,01E+12	1,36E+06	1,00E+00	4,82E+00	1,85E-01	228,3	236,4
3	9,06E+02	9,06E+02	1,55E+05	1,42E+08	4,12E+04	8,49E+10	5,40E+11	1,04E+11	2,66E+08	1,00E+00	7,67E+01	3,89E-02	389,9	365,1
4	1,02E+03	1,02E+03	9,69E+04	6,54E+06	1,06E+04	2,07E+10	9,71E+10	1,62E+10	5,53E+08	1,00E+00	3,69E+02	1,04E-02	654,2	564,4
5	1,03E+03	1,03E+03	1,22E+05	8,40E+06	2,31E+04	1,06E+10	3,57E+10	5,07E+09	3,54E+08	1,00E+00	1,95E+03	5,45E-03	826,1	763,5
6	1,56E+03	1,56E+03	1,43E+05	1,23E+07	5,64E+04	4,69E+09	1,07E+10	1,14E+09	2,62E+08	1,61E+00	8,63E+03	2,79E-03	1386,4	1212,2
7	2,23E+03	2,23E+03	2,03E+05	1,70E+07	2,24E+05	2,57E+09	4,20E+09	3,06E+08	2,29E+08	1,65E+01	2,81E+04	1,64E-03	1833,6	1627,4
8	5,14E+03	5,14E+03	1,20E+06	3,39E+08	3,13E+07	1,18E+09	1,18E+09	2,56E+07	3,01E+07	3,92E+05	5,44E+04	1,39E-03	4108,9	3488,2
9	7,11E+03	7,11E+03	3,53E+06	3,86E+08	3,94E+07	8,92E+08	6,78E+08	1,00E+00	1,25E+06	2,54E+06	1,68E+05	1,07E-03	4605,4	3882,6
10	6,75E+03	6,75E+03	1,32E+07	2,73E+08	4,33E+07	3,21E+08	9,14E+07	1,00E+00	4,46E+06	9,71E+06	2,72E+06	8,65E-04	9145,9	8327,2
11	6,41E+03	6,41E+03	1,45E+07	2,92E+08	4,67E+07	3,51E+08	1,03E+08	1,00E+00	1,70E+06	1,10E+07	2,97E+06	6,37E-04	5826,0	5532,2
12	6,61E+03	6,61E+03	1,99E+07	1,47E+08	2,49E+07	1,94E+08	4,44E+07	1,00E+00	1,35E+06	1,26E+07	7,10E+06	3,86E-04	6841,2	6077,4
13	7,09E+03	7,09E+03	2,42E+07	6,90E+07	1,35E+07	1,19E+08	1,30E+07	1,00E+00	1,13E+06	1,40E+07	1,00E+07	2,59E-04	8165,9	7107,0

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 =120.00 TDAT2 =150.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6.85E+02	6.85E+02	6.58E+04	3.45E+10	2.69E+03	2.97E+11	2.07E+13	5.47E+12	1.10E+06	1.00E+00	1.00E+00	9.03E-01	234.3	240.4
2	8.91E+02	8.91E+02	1.73E+05	7.38E+09	5.01E+04	2.70E+11	4.22E+12	1.01E+12	2.83E+06	1.00E+00	3.49E+00	2.29E-01	269.7	301.6
3	1.13E+03	1.13E+03	1.11E+05	1.57E+04	1.45E+04	8.61E+10	5.83E+11	1.15E+11	2.54E+09	1.00E+00	3.29E+01	4.50E-02	446.4	415.3
4	1.31E+03	1.31E+03	8.77E+04	8.41E+03	1.18E+04	3.19E+10	1.46E+11	2.32E+10	3.89E+09	1.00E+00	1.61E+02	1.60E-02	648.2	569.8
5	1.29E+03	1.29E+03	7.62E+04	4.97E+03	3.42E+03	1.12E+10	4.01E+10	5.36E+09	1.88E+09	1.00E+00	6.24E+02	5.31E-03	739.7	665.6
6	2.08E+03	2.08E+03	4.59E+04	9.68E+04	2.40E+04	6.06E+09	1.48E+10	1.28E+09	1.57E+09	1.00E+00	1.97E+03	3.80E-03	1334.3	1164.7
7	5.51E+03	5.51E+03	5.05E+05	2.43E+08	1.67E+07	2.87E+09	3.49E+09	1.00E+00	1.06E+07	8.58E+02	1.99E+03	2.70E-03	3098.4	2736.3
8	6.45E+03	6.45E+03	3.73E+05	6.27E+08	1.14E+07	1.69E+09	1.93E+09	1.00E+00	1.85E+07	3.06E+03	2.99E+03	2.01E-03	3935.0	3366.1
9	7.89E+03	7.89E+03	1.08E+06	7.55E+08	1.48E+07	1.13E+09	9.85E+08	1.00E+00	1.42E+07	4.55E+05	1.85E+04	1.56E-03	4604.3	3642.2
10	7.87E+03	7.87E+03	1.55E+08	5.95E+08	1.21E+08	3.43E+08	6.46E+05	1.00E+00	3.88E+03	1.44E+08	3.98E+07	1.36E-03	8152.0	6064.0
11	7.69E+03	7.69E+03	2.11E+08	6.97E+08	1.21E+08	3.91E+08	9.74E+05	1.00E+00	1.00E+00	1.64E+08	4.58E+07	1.19E-03	5868.8	5153.5
12	9.31E+03	9.31E+03	1.51E+08	1.81E+08	4.05E+07	1.51E+08	1.05E+05	1.00E+00	1.06E+03	1.06E+08	4.48E+07	8.14E-04	9741.0	8601.7
13	8.80E+03	8.80E+03	1.80E+08	1.58E+08	3.36E+07	1.55E+08	5.05E+04	1.00E+00	2.07E+02	1.23E+08	5.61E+07	7.97E-04	8262.0	7667.3

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 =120.00 TDAT2 =150.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.00E+03	1.00E+03	7.00E+04	4.70E+09	1.24E+04	4.35E+11	1.84E+13	4.76E+12	1.30E+08	1.00E+00	1.00E+00	1.29E+00	332.6	395.4
2	1.09E+03	1.09E+03	1.05E+05	3.13E+03	3.42E+03	2.17E+11	5.45E+12	1.37E+12	1.20E+09	1.00E+00	1.00E+00	2.94E-01	300.0	302.5
3	1.28E+03	1.28E+03	6.26E+04	2.19E+03	3.88E+03	9.82E+10	1.31E+12	3.04E+11	3.01E+10	1.00E+00	2.40E+00	7.68E-02	355.6	320.9
4	1.72E+03	1.72E+03	5.67E+04	1.94E+03	2.22E+03	6.20E+10	3.48E+11	6.16E+10	4.18E+10	1.00E+00	1.76E+01	3.27E-02	526.0	470.7
5	1.94E+03	1.94E+03	5.17E+04	2.92E+03	4.85E+03	3.81E+10	1.40E+11	1.76E+10	3.15E+10	1.00E+00	6.02E+01	2.12E-02	742.1	645.4
6	2.14E+03	2.14E+03	5.72E+04	2.56E+03	7.09E+03	2.50E+10	7.26E+10	6.40E+09	2.10E+10	1.00E+00	1.52E+02	1.46E-02	987.1	874.0
7	2.76E+03	2.76E+03	6.44E+04	3.34E+03	9.06E+03	1.49E+10	3.61E+10	2.27E+09	9.34E+09	1.00E+00	2.43E+02	9.82E-03	1308.2	1172.4
8	4.30E+03	4.30E+03	8.45E+05	1.99E+08	5.09E+05	8.96E+09	1.48E+10	2.31E+08	6.38E+08	7.24E+00	3.09E+02	9.79E-03	3152.0	2663.9
9	7.65E+03	7.65E+03	6.99E+07	4.76E+09	5.72E+08	3.42E+09	3.40E+09	1.00E+00	1.00E+00	6.41E+07	1.18E+06	4.65E-03	3218.2	2620.6
10	6.32E+03	6.32E+03	5.79E+08	5.25E+09	7.09E+08	1.21E+09	2.53E+00	1.00E+00	1.00E+00	5.53E+08	2.43E+08	3.44E-03	3216.6	2620.9
11	4.30E+03	4.30E+03	1.50E+09	2.64E+09	8.52E+07	5.86E+08	1.12E+00	1.00E+00	1.00E+00	8.37E+08	4.62E+08	2.50E-03	3171.5	2735.9
12	3.91E+03	3.91E+03	1.24E+09	1.26E+09	2.40E+07	3.54E+08	1.03E+00	1.00E+00	1.00E+00	8.30E+08	4.08E+08	1.89E-03	3490.1	2957.7
13	4.19E+03	4.19E+03	1.15E+09	8.30E+08	1.04E+07	2.78E+08	1.02E+00	1.00E+00	1.00E+00	7.81E+08	3.70E+08	1.72E-03	3710.4	3265.2

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 =120.00 TDAT2 =150.00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1.37E+03	1.37E+03	6.57E+04	2.15E+03	3.01E+03	4.02E+11	1.05E+13	2.65E+12	2.80E+10	1.00E+00	1.00E+00	9.10E-01	459.5	483.4
2	1.40E+03	1.40E+03	3.60E+04	2.86E+03	3.95E+03	2.26E+11	5.65E+12	1.41E+12	5.58E+10	1.00E+00	1.00E+00	3.86E-01	321.5	377.3
3	1.51E+03	1.51E+03	2.81E+04	1.86E+03	6.31E+02	1.15E+11	1.96E+12	4.69E+11	8.08E+10	1.00E+00	1.00E+00	1.01E-01	314.6	282.0
4	1.97E+03	1.97E+03	3.63E+04	3.42E+03	1.64E+03	1.01E+11	6.44E+11	1.20E+11	1.29E+11	1.00E+00	4.64E+00	6.41E-02	563.1	465.5
5	2.53E+03	2.53E+03	8.61E+04	2.43E+02	1.00E+00	6.35E+10	1.80E+11	2.09E+10	2.33E+10	1.00E+00	1.79E+01	4.68E-02	1377.7	1205.3
6	3.06E+03	3.06E+03	1.17E+05	8.69E+03	2.10E+04	6.57E+10	1.18E+11	4.96E+09	5.39E+09	1.00E+00	3.46E+01	4.07E-02	1752.6	1537.6
7	3.37E+03	3.37E+03	1.56E+05	1.46E+08	4.07E+05	6.51E+10	9.57E+10	1.00E+00	1.10E+08	1.00E+00	4.06E+01	3.33E-02	1690.3	1499.1
8	3.60E+03	3.60E+03	6.97E+05	3.47E+09	1.16E+07	4.85E+10	6.47E+10	1.00E+00	3.55E+04	5.48E+01	5.63E+01	2.33E-02	1712.0	1510.1
9	4.81E+03	4.81E+03	1.73E+06	8.40E+09	3.07E+07	2.81E+10	2.46E+10	1.00E+00	1.00E+00	4.25E+02	1.21E+02	1.82E-02	2468.3	2165.6
10	5.18E+03	5.18E+03	6.38E+06	1.08E+10	4.80E+08	2.47E+10	2.08E+10	1.00E+00	1.00E+00	3.84E+05	1.91E+04	1.43E-02	2094.3	1633.3
11	7.51E+03	7.51E+03	2.52E+07	1.84E+10	3.24E+09	8.35E+09	2.41E+09	1.00E+00	1.00E+00	1.03E+07	6.15E+05	1.03E-02	2614.3	2264.2
12	5.26E+03	5.26E+03	1.88E+09	1.27E+10	1.06E+09	2.59E+09	2.96E+00	1.00E+00	1.00E+00	6.71E+08	1.21E+09	7.22E-03	2760.7	2377.1
13	4.16E+03	4.16E+03	2.52E+09	7.25E+09	2.51E+08	1.26E+09	1.44E+00	1.00E+00	1.00E+00	1.32E+09	1.20E+09	5.59E-03	2941.0	2574.2

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 150,00

COLUMN (4, 1) = 4

	HC O2 (HTOP)O	RHO END HE	T ELECT ENP M+	ENE UP TH	VCENTR P	VEL Q	EN48 T N2VIB	EN2D CO2	O	N2 GAMB
K = 1	9,500E+06	1,238E-09	6,864E+02	6,671E+04	-3,065E+03	-6,131E+03	3,376E+10	3,943E+03	2,959E+11	2,031E+13
	5,350E+12	1,141E+06	1,000E+00	1,066E+00	8,893E-01	6,384E-02	6,864E+02	8,325E+09	IIII	6,211E+02
	9,751E+06	1,203E+09	6,671E+04	2,478E+02						
K = 2	1,075E+07	2,318E-10	8,963E+02	1,662E+05	-7,823E+03	-9,515E+03	6,540E+09	4,606E+04	2,490E+11	3,803E+12
	9,053E+11	2,908E+08	1,000E+00	6,829E+00	2,129E-01	6,851E-03	8,963E+02	1,520E+09	IIII	3,345E+03
	1,057E+07	2,252E+08	1,662E+05	3,105E+02						
K = 3	1,250E+07	3,551E-11	1,127E+03	1,110E+05	-6,772E+03	-4,030E+03	1,574E+04	1,451E+04	8,612E+10	5,833E+11
	1,146E+11	2,537E+09	1,000E+00	3,286E+01	5,628E-02	0,	1,127E+03	1,860E+08	IIII	1,837E+03
	1,111E+07	3,442E+07	1,109E+05	5,181E+02						
K = 4	1,475E+07	1,695E-11	1,199E+03	9,476E+04	3,791E+03	1,161E+04	1,063E+04	1,264E+04	4,832E+10	2,781E+11
	5,083E+10	3,483E+09	1,000E+00	1,226E+02	2,537E-02	0,	1,199E+03	7,759E+07	IIII	1,560E+03
	1,171E+07	1,661E+07	9,464E+04	4,826E+02						
K = 5	1,750E+07	7,625E-12	1,311E+03	8,545E+04	2,256E+04	3,350E+04	7,730E+03	1,016E+04	2,782E+10	1,248E+11
	1,965E+10	3,495E+09	1,000E+00	2,533E+02	1,219E-02	0,	1,311E+03	2,539E+07	IIII	1,368E+03
	1,238E+07	7,915E+06	8,520E+04	5,022E+02						
K = 6	2,075E+07	2,465E-12	1,283E+03	7,624E+04	4,281E+04	5,211E+04	4,967E+03	3,424E+03	1,119E+10	4,009E+10
	5,363E+09	1,884E+09	1,000E+00	6,241E+02	5,759E-03	0,	1,283E+03	4,375E+06	IIII	1,081E+03
	1,311E+07	3,998E+06	7,561E+04	7,126E+02						
K = 7	2,450E+07	1,428E-12	1,662E+03	8,953E+04	6,545E+04	7,879E+04	6,707E+04	1,735E+04	7,719E+09	2,297E+10
	2,602E+09	1,668E+09	1,000E+00	1,531E+03	4,316E-03	0,	1,662E+03	2,079E+06	IIII	1,205E+03
	1,403E+07	3,561E+06	8,799E+04	8,941E+02						
K = 8	2,900E+07	6,442E-13	2,715E+03	2,718E+05	9,683E+04	1,149E+05	1,046E+08	7,192E+06	4,684E+09	1,013E+10
	7,284E+08	8,984E+08	3,699E+02	1,975E+03	3,323E-03	0,	2,715E+03	6,334E+05	IIII	1,146E+03
	1,507E+07	2,621E+06	2,695E+05	1,453E+03						
K = 9	3,450E+07	2,358E-13	5,633E+03	4,738E+05	1,369E+05	1,590E+05	3,329E+08	1,544E+07	2,590E+09	3,510E+09
	1,000E+00	1,704E+07	1,374E+03	2,223E+03	2,536E-03	0,	5,633E+03	1,523E+05	IIII	9,962E+02
	1,601E+07	1,536E+06	4,702E+05	2,839E+03						
K =10	4,100E+07	1,405E-13	6,452E+03	3,734E+05	1,878E+05	2,166E+05	6,272E+08	1,141E+07	1,691E+09	1,930E+09
	1,000E+00	1,855E+07	3,059E+03	2,988E+03	2,019E-03	0,	6,452E+03	7,495E+04	IIII	1,014E+03
	1,701E+07	1,154E+06	3,674E+05	3,415E+03						
K =11	4,850E+07	9,344E-14	7,440E+03	9,466E+05	2,525E+05	2,883E+05	7,286E+08	1,413E+07	1,234E+09	1,166E+09
	1,000E+00	1,501E+07	3,686E+05	1,555E+04	1,712E-03	0,	7,440E+03	3,861E+04	IIII	9,840E+02
	1,805E+07	9,354E+05	5,625E+05	3,923E+03						
K =12	5,700E+07	6,906E-14	7,551E+03	4,461E+07	3,295E+05	3,708E+05	7,153E+08	3,990E+07	9,402E+08	7,520E+08
	1,000E+00	1,082E+07	3,442E+07	9,434E+06	1,493E-03	0,	7,551E+03	2,357E+04	IIII	9,993E+02
	1,920E+07	7,515E+05	7,519E+05	4,184E+03						
K =13	6,650E+07	2,896E-14	7,870E+03	1,850E+08	4,168E+05	4,629E+05	5,950E+08	1,209E+08	3,428E+08	6,459E+05
	1,000E+00	3,876E+03	1,440E+08	3,980E+07	1,350E-03	0,	7,870E+03	2,863E+03	IIII	1,072E+03
	2,046E+07	3,259E+05	1,214E+06	6,688E+03						

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 150,00

COLUMN (5, 1) = 5

	HC O2 (HTOP)O	RHO END HF	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN4S T N2V1B	EN2D CO2	O	N2 QAMB
K = 1	9,500E+06	8,191E-10	1,019E+03	8,322E+04	-2,640E+03	-5,280E+03	2,908E+09	8,976E+03	3,508E+11	1,345E+13
	3,464E+12	5,383E+08	1,000E+00	1,000E+00	1,020E+00	4,496E-02	1,019E+03	5,492E+09	IIII	6,154E+02
	9,522E+06	7,938E+08	8,322E+04	4,279E+02						
K = 2	1,075E+07	3,129E-10	1,097E+03	1,015E+05	-1,075E+04	-1,621E+04	3,058E+03	3,450E+03	2,080E+11	5,140E+12
	1,287E+12	3,387E+09	1,000E+00	1,106E+00	2,577E-01	3,470E-02	1,097E+03	2,096E+09	IIII	1,104E+03
	9,981E+06	3,031E+08	1,015E+05	2,811E+02						
K = 3	1,250E+07	7,982E-11	1,280E+03	6,257E+04	-1,082E+04	-5,423E+03	2,187E+03	3,879E+03	9,816E+10	1,310E+12
	3,042E+11	3,012E+10	1,000E+00	2,395E+00	1,014E-01	0,	1,280E+03	5,216E+08	IIII	7,887E+02
	1,027E+07	7,720E+07	6,257E+04	4,215E+02						
K = 4	1,475E+07	4,836E-11	1,395E+03	5,943E+04	1,863E+03	9,148E+03	2,056E+03	2,989E+03	7,871E+10	7,928E+11
	1,738E+11	3,639E+10	1,000E+00	1,055E+01	5,191E-02	0,	1,395E+03	3,079E+08	IIII	7,077E+02
	1,057E+07	4,671E+07	5,942E+04	3,475E+02						
K = 5	1,750E+07	2,095E-11	1,726E+03	5,658E+04	1,850E+04	2,785E+04	1,971E+03	2,297E+03	6,131E+10	3,421E+11
	6,043E+10	4,150E+10	1,000E+00	1,875E+01	3,063E-02	0,	1,726E+03	1,218E+08	IIII	6,366E+02
	1,087E+07	2,013E+07	5,656E+04	4,390E+02						
K = 6	2,075E+07	8,615E-12	1,988E+03	5,167E+04	4,069E+04	5,354E+04	2,921E+03	4,855E+03	3,813E+10	1,401E+11
	1,781E+10	3,151E+10	1,000E+00	6,018E+01	2,268E-02	0,	1,988E+03	4,173E+07	IIII	5,876E+02
	1,117E+07	8,237E+06	5,161E+04	7,216E+02						
K = 7	2,450E+07	6,069E-12	2,057E+03	5,509E+04	6,752E+04	8,150E+04	2,698E+03	6,230E+03	3,007E+10	9,859E+10
	1,082E+10	2,503E+10	1,000E+00	1,170E+02	1,723E-02	0,	2,057E+03	2,627E+07	IIII	6,070E+02
	1,155E+07	5,849E+06	5,498E+04	7,584E+02						
K = 8	2,900E+07	3,665E-12	2,277E+03	5,976E+04	9,732E+04	1,131E+05	2,834E+03	7,784E+03	2,147E+10	5,977E+10
	4,981E+09	1,688E+10	1,000E+00	1,845E+02	1,276E-02	0,	2,277E+03	1,290E+07	IIII	5,951E+02
	1,205E+07	3,703E+06	5,957E+04	8,961E+02						
K = 9	3,450E+07	1,963E-12	2,904E+03	2,150E+05	1,325E+05	1,519E+05	3,843E+07	1,056E+05	1,376E+10	3,202E+10
	1,875E+09	7,662E+09	2,204E+00	2,560E+02	9,814E-03	0,	2,904E+03	5,190E+06	IIII	5,204E+02
	1,262E+07	2,260E+06	2,148E+05	1,284E+03						
K =10	4,100E+07	8,651E-13	4,298E+03	8,448E+05	1,888E+05	2,257E+05	1,990E+08	5,092E+05	8,959E+09	1,480E+10
	2,314E+08	6,380E+08	7,237E+00	3,089E+02	9,788E-03	0,	4,298E+03	1,501E+06	IIII	3,925E+02
	1,316E+07	1,258E+06	8,445E+05	2,855E+03						
K =11	4,850E+07	4,382E-13	6,285E+03	5,939E+07	2,533E+05	2,810E+05	4,066E+09	4,849E+08	4,259E+09	5,137E+09
	3,521E+07	9,707E+07	5,434E+07	9,977E+05	5,764E-03	0,	6,285E+03	5,564E+05	IIII	3,346E+02
	1,374E+07	7,944E+05	4,047E+06	2,926E+03						
K =12	5,700E+07	2,562E-13	7,102E+03	3,761E+08	3,107E+05	3,404E+05	5,057E+09	6,542E+08	2,088E+09	1,355E+09
	1,000E+00	1,000E+00	2,260E+08	1,465E+08	4,020E-03	0,	7,102E+03	2,145E+05	IIII	3,133E+02
	1,432E+07	5,006E+05	3,522E+06	2,775E+03						
K =13	6,650E+07	1,599E-13	5,297E+03	8,314E+08	3,756E+05	4,107E+05	4,338E+09	4,901E+08	9,909E+08	1,907E+00
	1,000E+00	1,000E+00	5,097E+08	3,196E+08	3,088E-03	0,	5,297E+03	7,435E+04	IIII	3,161E+02
	1,494E+07	2,789E+05	2,042E+06	2,701E+03						

OUTPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FROM REZONE AT TIME = 150.00

COLUMN (6, 1) = 6

	HC / 02 / (HT)PD	RHO / F(J) / HF	T ELECT / ENP / M+	ENE / OP / TH	VCENTR / P	VEL / Q	EN4S / T N2VIB	EN2D / CO2	C	N2 / QAMB
K = 1	4.500E+06	5.362E-10	1.377E+03	5.385E+04	-1.055E+03	-2.106E+03	2.401E+03	3.343E+03	3.392E+11	8.800E+12
	2.206E+12	3.075E+10	1.000E+00	1.000E+00	7.816E-01	1.172E-02	1.377E+03	3.576E+09	IIII	1.648E+02
	4.515E+06	5.162E+08	5.385E+04	4.974E+02						
K = 2	1.075E+07	2.696E-10	1.419E+03	3.340E+04	-1.257E+04	-2.303E+04	2.525E+03	2.849E+03	1.894E+11	4.424E+12
	1.194E+12	5.071E+10	1.000E+00	1.000E+00	3.044E-01	7.887E-02	1.419E+03	1.798E+09	IIII	1.904E+02
	9.576E+06	2.599E+08	3.340E+04	3.825E+02						
K = 3	1.250E+07	1.124E-10	1.512E+03	2.810E+04	-1.807E+04	-1.312E+04	1.857E+03	6.308E+02	1.154E+11	1.958E+12
	4.693E+11	8.081E+10	1.000E+00	1.000E+00	1.146E-01	0.	1.512E+03	7.956E+08	IIII	2.647E+02
	9.766E+06	1.150E+08	2.809E+04	3.162E+02						
K = 4	1.475E+07	6.937E-11	1.683E+03	3.324E+04	-4.081E+03	4.953E+03	2.838E+03	1.260E+03	1.062E+11	1.136E+12
	2.509E+11	1.108E+11	1.000E+00	3.277E+00	6.080E-02	0.	1.683E+03	4.606E+08	IIII	3.702E+02
	9.976E+06	6.662E+07	3.323E+04	3.648E+02						
K = 5	1.750E+07	3.940E-11	1.970E+03	3.631E+04	1.784E+04	3.073E+04	3.424E+03	1.637E+03	1.007E+11	6.430E+11
	1.205E+11	1.287E+11	1.000E+00	4.640E+00	6.152E-02	0.	1.970E+03	2.602E+08	IIII	4.333E+02
	1.020E+07	3.766E+07	3.631E+04	4.485E+02						
K = 6	2.075E+07	1.252E-11	2.423E+03	8.294E+04	4.398E+04	5.724E+04	4.446E+02	1.047E+02	6.585E+10	2.092E+11
	2.716E+10	2.929E+10	1.000E+00	1.708E+01	5.044E-02	0.	2.423E+03	7.678E+07	IIII	2.244E+02
	1.035E+07	1.164E+07	8.292E+04	1.100E+03						
K = 7	2.451E+07	8.924E-12	2.711E+03	9.970E+04	7.234E+04	8.745E+04	3.937E+03	9.202E+03	6.443E+10	1.526E+11
	1.592E+10	1.547E+10	1.000E+00	2.521E+01	4.402E-02	0.	2.711E+03	5.216E+07	IIII	2.051E+02
	1.047E+07	8.194E+06	9.968E+04	1.294E+03						
K = 8	2.900E+07	6.598E-12	3.100E+03	1.228E+05	1.062E+05	1.250E+05	2.103E+07	7.644E+04	6.557E+10	1.144E+11
	4.284E+09	4.628E+09	1.000E+00	3.545E+01	3.913E-02	0.	3.100E+03	3.507E+07	IIII	1.977E+02
	1.062E+07	5.834E+06	1.227E+05	1.500E+03						
K = 9	3.450E+07	5.416E-12	3.372E+03	1.647E+05	1.455E+05	1.660E+05	2.019E+08	5.944E+05	6.481E+10	9.533E+10
	1.000E+00	1.084E+08	1.901E+00	4.083E+01	3.274E-02	0.	3.372E+03	2.683E+07	IIII	1.934E+02
	1.081E+07	4.678E+06	1.647E+05	1.478E+03						
K =10	4.100E+07	3.776E-12	3.599E+03	6.969E+05	1.809E+05	2.138E+05	3.466E+09	1.162E+07	4.655E+10	6.467E+10
	1.000E+00	3.548E+04	5.479E+01	5.634E+01	2.491E-02	0.	3.599E+03	1.750E+07	IIII	1.838E+02
	1.102E+07	3.182E+06	6.968E+05	1.546E+03						
K =11	4.650E+07	2.021E-12	4.391E+03	1.551E+06	2.415E+05	2.693E+05	7.553E+09	2.746E+07	3.157E+10	3.149E+10
	1.000E+00	6.076E+03	3.618E+02	1.096E+02	1.967E-02	0.	4.391E+03	7.326E+06	IIII	1.811E+02
	1.125E+07	1.568E+06	1.550E+06	2.017E+03						
K =12	5.700E+07	1.576E-12	5.015E+03	4.496E+06	3.006E+05	3.323E+05	9.830E+09	2.979E+08	2.606E+10	2.233E+10
	1.000E+00	1.000E+00	2.285E+05	1.141E+04	1.601E-02	0.	5.015E+03	4.820E+06	IIII	1.825E+02
	1.152E+07	1.159E+06	4.256E+06	1.980E+03						
K =13	6.650E+07	1.263E-12	5.343E+03	1.299E+07	3.681E+05	4.038E+05	1.366E+10	1.448E+09	1.897E+10	1.431E+10
	1.000E+00	1.000E+00	3.880E+06	2.283E+05	1.282E-02	0.	5.343E+03	3.379E+06	IIII	1.825E+02
	1.185E+07	8.759E+05	8.878E+06	1.917E+03						

OUTPUT FROM HYDRO1 FOR COLUMN (1, 1) = 1 AND TIME = 180.0

KCYC= 3 TIMDEL= 2.000000E-03 TIMTOT= 1.170000E-01 TTX= 1.206100E+01 DSMALL= 1.018797E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9.357502E+06	1.695519E-09	-7.490651E+02	2.988055E+23	1.267466E+09	1.074506E+00	1.504561E-02	9.715004E+06	-1.498130E+03
2	1.003071E+07	5.140069E-10	-4.922379E+02	2.644174E+23	1.376255E+09	3.537035E-01	0.	1.034641E+07	5.136543E+02
3	1.066130E+07	1.842555E-10	-1.396439E+03	2.835733E+23	1.609407E+09	1.482695E-01	6.176447E-03	1.102218E+07	-3.306533E+03
4	1.149235E+07	5.160574E-11	-3.918756E+03	3.955713E+23	1.925230E+09	4.967647E-02	0.	1.196252E+07	-4.530960E+03
5	1.247457E+07	1.773519E-11	-3.484273E+03	4.321205E+23	2.697478E+09	2.564366E-02	0.	1.298663E+07	-2.435565E+03
6	1.363052E+07	6.420723E-12	-5.600176E+03	5.453108E+23	3.749124E+09	1.203605E-02	4.443845E-04	1.427441E+07	-8.764767E+03
7	1.531010E+07	2.485471E-12	-6.459160E+03	8.016606E+23	4.171595E+09	5.180017E-03	0.	1.634579E+07	-4.155534E+03
8	1.734430E+07	1.377174E-12	3.324009E+03	8.554891E+23	5.943703E+09	4.092757E-03	0.	1.834320E+07	1.040155E+04
9	2.014274E+07	5.147861E-13	1.010885E+04	1.554706E+24	7.177885E+09	1.847538E-03	0.	2.194232E+07	9.410145E+03
10	2.462614E+07	1.694822E-13	3.700186E+04	2.527087E+24	1.141702E+10	9.389466E-04	0.	2.709946E+07	6.630758E+04
11	3.142529E+07	6.285916E-14	7.129437E+04	3.320993E+24	1.909514E+10	5.999612E-04	0.	3.514063E+07	7.620116E+04
12	4.232548E+07	1.326395E-14	9.856450E+04	6.031694E+24	3.010813E+10	2.000743E-04	0.	4.950634E+07	1.204279E+05
13	5.942930E+07	3.567745E-15	1.655899E+05	9.629003E+24	4.157593E+10	7.416617E-05	0.	6.935259E+07	2.102518E+05

OUTPUT FROM HYDRO1 FOR COLUMN (2, 1) = 2 AND TIME = 180.0

KCYC= 4 TIMDEL= 2.000000E-03 TIMTOT= 1.190000E-01 TTX= 1.207000E+01 DSMALL= 7.891023E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9.354344E+06	1.710607E-09	-1.024113E+03	2.961630E+23	1.502219E+09	1.113818E+00	2.558444E-02	9.708688E+06	-2.048226E+03
2	1.005979E+07	4.622115E-10	-9.406898E+02	2.940491E+23	1.401586E+09	3.239146E-01	0.	1.041078E+07	1.606406E+02
3	1.074008E+07	1.870266E-10	-3.120698E+03	2.764098E+23	1.698060E+09	1.004909E-01	1.222993E-02	1.106938E+07	-6.408242E+03
4	1.161474E+07	4.437569E-11	-6.424759E+03	4.589867E+23	2.170621E+09	4.826994E-02	0.	1.216005E+07	-6.441276E+03
5	1.282735E+07	1.359425E-11	-5.382439E+03	5.637485E+23	3.305053E+09	2.246466E-02	0.	1.349466E+07	-4.323601E+03
6	1.440900E+07	4.510744E-12	-6.941734E+03	7.762111E+23	3.614157E+09	6.151268E-03	2.684228E-04	1.532334E+07	-9.554867E+03
7	1.654204E+07	2.019424E-12	-4.897519E+02	1.084259E+24	4.412047E+09	4.454897E-03	0.	1.786073E+07	8.580363E+03
8	1.906811E+07	1.133178E-12	1.418554E+04	1.034693E+24	6.300423E+09	3.564752E-03	0.	2.027549E+07	1.474072E+04
9	2.253561E+07	4.069153E-13	2.331259E+04	1.966849E+24	7.572440E+09	1.540671E-03	0.	2.479573E+07	2.683406E+04
10	2.956026E+07	9.772919E-14	7.736691E+04	4.253164E+24	1.603973E+10	8.033259E-04	0.	3.436479E+07	1.270946E+05
11	4.046400E+07	3.726316E-14	1.385843E+05	5.600345E+24	3.044774E+10	5.072894E-04	0.	4.656326E+07	1.492666E+05
12	5.736568E+07	6.441166E-15	2.026106E+05	1.002065E+25	4.577276E+10	1.931678E-04	0.	6.816484E+07	2.554525E+05
13	8.106994E+07	2.581101E-15	3.304184E+05	1.330976E+25	5.542319E+10	7.152642E-05	0.	9.597141E+07	4.120843E+05

OUTPUT FROM HYDRO1 FOR COLUMN (3, 1) = 3 AND TIME = 180.0

KCYC= 3 TIMDEL= 1.000000E-03 TIMTOT= 1.200000E-01 TTX= 1.207900E+01 DSMALL= 1.237789E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT. E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9.414167E+06	1.550703E-09	-1.883558E+03	3.462439E+23	1.425338E+09	1.103567E+00	4.750499E-02	9.828373E+06	-3.767117E+03
2	1.034563E+07	3.239150E-10	-8.582459E+03	4.672444E+23	1.574494E+09	2.550011E-01	2.939845E-02	1.094206E+07	-1.339776E+04
3	1.196057E+07	3.317618E-11	-1.526863E+04	8.574597E+23	2.375055E+09	3.934759E-02	9.604112E-04	1.297825E+07	-1.713949E+04
4	1.436613E+07	4.972032E-12	-9.170984E+03	1.690459E+24	3.197482E+09	7.948991E-03	0.	1.695401E+07	-1.202476E+03
5	1.694490E+07	1.906390E-12	9.564367E+03	1.748389E+24	4.535173E+09	4.322914E-03	0.	2.101579E+07	2.033121E+04
6	2.583393E+07	5.094558E-13	3.800549E+04	2.462130E+24	7.215740E+09	1.982305E-03	0.	2.665207E+07	5.647977E+04
7	2.951644E+07	2.461803E-13	6.806896E+04	2.546190E+24	1.075215E+10	1.323505E-03	0.	3.238181E+07	7.965815E+04
8	3.681562E+07	7.184846E-14	1.154982E+05	4.027579E+24	2.522815E+10	9.065020E-04	0.	4.124963E+07	1.513362E+05
9	4.659793E+07	4.766393E-14	1.924772E+05	4.999969E+24	2.898735E+10	6.908255E-04	0.	5.194603E+07	2.330162E+05
10	5.701340E+07	1.526215E-14	2.687797E+05	4.883423E+24	7.938837E+10	6.058168E-04	0.	6.208176E+07	3.034453E+05
11	6.672900E+07	1.891134E-14	3.220412E+05	4.604316E+24	5.791939E+10	5.476605E-04	0.	7.137623E+07	3.401391E+05
12	7.780659E+07	9.280245E-15	3.661984E+05	6.573185E+24	6.280007E+10	2.914016E-04	0.	8.423694E+07	3.922577E+05
13	9.146302E+07	5.099669E-15	4.109314E+05	7.671495E+24	7.859744E+10	2.004113E-04	0.	9.868948E+07	4.296051E+05

OUTPUT FROM HYDRO1 FOR COLUMN (4, 1) = 4 AND TIME = 180,0

KCYC= 3 TIMDEL= 1,000000E-03 TIMTOT= 1,210000E-01 TTX= 1,208800E+01 DSMALL= 1,187730E+01

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9,414404E+06	1,493661E-09	-1,882097E+03	3,464257E+23	1,581012E+09	1,180748E+00	5,511639E-02	9,828807E+06	-3,764193E+03
2	1,049183E+07	2,624389E-10	-8,092287E+03	5,561087E+23	1,955386E+09	2,565847E-01	2,038503E-02	1,115485E+07	-1,242038E+04
3	1,217906E+07	3,470899E-11	-1,399490E+04	8,635379E+23	3,132492E+09	5,436281E-02	7,321886E-04	1,320326E+07	-1,550942E+04
4	1,465399E+07	1,460869E-11	-1,026081E+04	1,232492E+24	2,770109E+09	2,023383E-02	0,	1,610472E+07	-4,952203E+03
5	1,793328E+07	6,246894E-12	5,826357E+03	1,569158E+24	2,876883E+09	8,985790E-03	0,	1,976184E+07	1,660492E+04
6	2,175226E+07	2,160694E-12	2,368772E+04	1,728037E+24	4,363541E+09	4,714138E-03	0,	2,374269E+07	3,077053E+04
7	2,614866E+07	1,180941E-12	4,440402E+04	2,116783E+24	5,471144E+09	3,230550E-03	0,	2,855464E+07	5,803751E+04
8	3,162349E+07	5,207155E-13	7,780081E+04	2,744746E+24	9,214293E+09	2,399013E-03	0,	3,469235E+07	9,756410E+04
9	3,837853E+07	1,896719E-13	1,212911E+05	3,363835E+24	1,916683E+10	1,817704E-03	0,	4,206472E+07	1,450180E+05
10	4,641731E+07	1,111894E-13	1,731263E+05	4,067084E+24	2,536517E+10	1,410170E-03	0,	5,076991E+07	2,012346E+05
11	5,584140E+07	7,214194E-14	2,367508E+05	4,870421E+24	3,189295E+10	1,150410E-03	0,	6,091289E+07	2,722670E+05
12	6,665304E+07	5,311965E-14	3,137355E+05	5,685958E+24	3,703150E+10	9,835501E-04	0,	7,239320E+07	3,552041E+05
13	7,875002E+07	2,200633E-14	3,954081E+05	6,515164E+24	8,038266E+10	6,844636E-04	0,	8,510683E+07	4,350122E+05

OUTPUT FROM HYDRO1 FOR COLUMN (5, 1) = 5 AND TIME = 180,0

KCYC= 4 TIMDEL= 3,000000E-03 TIMTOT= 1,240000E-01 TTX= 1,209800E+01 DSMALL= 6,618321E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9,471989E+06	8,678301E-10	-4,847810E+00	3,946351E+23	2,565125E+09	1,113046E+00	0,	9,943978E+06	-9,695621E+00
2	1,043076E+07	4,825478E-10	-8,967838E+03	4,082154E+23	2,080040E+09	5,018594E-01	1,147658E-01	1,091755E+07	-1,792598E+04
3	1,199336E+07	7,431022E-11	-2,068629E+04	9,065230E+23	2,448656E+09	9,098008E-02	3,409857E-03	1,306916E+07	-2,344660E+04
4	1,451228E+07	4,192342E-11	-1,788585E+04	1,225490E+24	1,993206E+09	4,178101E-02	0,	1,595539E+07	-1,232509E+04
5	1,772532E+07	1,773866E-11	-3,618210E+03	1,517879E+24	2,682552E+09	2,379244E-02	0,	1,949524E+07	5,088674E+03
6	2,163745E+07	7,018795E-12	1,828018E+04	1,859160E+24	4,726559E+09	1,658737E-02	0,	2,377965E+07	3,147168E+04
7	2,620358E+07	4,982194E-12	4,573958E+04	2,132932E+24	5,118415E+09	1,275047E-02	0,	2,862751E+07	6,000748E+04
8	3,160287E+07	3,072061E-12	7,593645E+04	2,660959E+24	6,296317E+09	9,671335E-03	0,	3,457823E+07	9,186543E+04
9	3,813025E+07	1,639828E-12	1,098890E+05	3,239019E+24	9,104054E+09	7,464543E-03	0,	4,168227E+07	1,279125E+05
10	4,645283E+07	6,245948E-13	1,739360E+05	4,458111E+24	1,896835E+10	5,923767E-03	0,	5,122340E+07	2,199595E+05
11	5,601838E+07	3,576443E-13	2,462268E+05	4,607218E+24	2,364286E+10	4,227868E-03	0,	6,081336E+07	2,724942E+05
12	6,618505E+07	2,090624E-13	3,010710E+05	5,313883E+24	2,819940E+10	2,947718E-03	0,	7,155674E+07	3,296478E+05
13	7,757938E+07	1,286523E-13	3,613936E+05	6,152476E+24	3,444006E+10	2,215396E-03	0,	8,360202E+07	3,931394E+05

OUTPUT FROM HYDRO1 FOR COLUMN (6, 1) = 6 AND TIME = 180,0

KCYC= 4 TIMDEL= 2,000000E-03 TIMTOT= 1,260000E-01 TTX= 1,210700E+01 DSMALL= 8,207716E+00

K	CEN. ALT.,CM	DENSITY,G/CM3	VCENTR,CM/S	VOLUME,CM3/SR	INT, E.,ERG/G	PRESS.,D/CM2	Q,D/CM2	TOP ALT.,CM	VTUP,CM/S
1	9,434472E+06	6,171905E-10	-4,030491E+03	3,632249E+23	3,127383E+09	9,650955E-01	5,175545E-02	9,868945E+06	-8,060982E+03
2	1,035131E+07	4,154406E-10	-1,212619E+04	4,086069E+23	2,873755E+09	5,969372E-01	5,376936E-02	1,084368E+07	-1,619140E+04
3	1,180328E+07	1,247424E-10	-2,578306E+04	8,081357E+23	1,961024E+09	1,223114E-01	2,235581E-02	1,276289E+07	-3,537473E+04
4	1,427485E+07	5,743422E-11	-2,730772E+04	1,283013E+24	2,111914E+09	6,064807E-02	0,	1,578680E+07	-1,924071E+04
5	1,767417E+07	3,129612E-11	-6,408665E+03	1,618346E+24	2,768221E+09	4,331728E-02	0,	1,956154E+07	6,423385E+03
6	2,171764E+07	1,013334E-11	2,027305E+04	1,871675E+24	7,214688E+09	3,655444E-02	0,	2,387374E+07	3,412272E+04
7	2,632576E+07	7,295438E-12	4,919629E+04	2,158393E+24	8,776989E+09	3,201599E-02	0,	2,877766E+07	6,426986E+04
8	3,185356E+07	5,317179E-12	8,381638E+04	2,752945E+24	1,059733E+10	2,817395E-02	0,	3,492947E+07	1,033629E+05
9	3,856472E+07	4,415638E-12	1,252041E+05	3,319182E+24	1,087157E+10	2,400246E-02	0,	4,219997E+07	1,470454E+05
10	4,641768E+07	3,083650E-12	1,710348E+05	3,941053E+24	1,187697E+10	1,831220E-02	0,	5,063540E+07	1,950243E+05
11	5,547146E+07	1,637881E-12	2,230162E+05	4,639360E+24	1,744971E+10	1,429028E-02	0,	6,030752E+07	2,510081E+05
12	6,575659E+07	1,269259E-12	2,827983E+05	5,383868E+24	1,814173E+10	1,151328E-02	0,	7,120566E+07	3,145866E+05
13	7,726918E+07	1,010429E-12	3,490832E+05	6,188868E+24	1,805901E+10	9,123677E-03	0,	8,333271E+07	3,835779E+05

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1   TDAT1 =150,00   TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,90E+02	3,90E+02	4,00E+04	5,41E+08	5,46E+03	3,30E+11	2,78E+13	7,36E+12	3,61E+07	1,00E+00	1,00E+00	1,07E+00	216,6	218,9
2	5,32E+02	5,32E+02	1,58E+05	6,24E+08	7,78E+04	4,31E+11	8,44E+12	2,07E+12	2,47E+07	1,00E+00	1,90E+00	3,54E-01	232,5	234,1
3	5,95E+02	5,95E+02	1,89E+05	2,60E+08	9,32E+04	3,30E+11	3,03E+12	6,54E+11	1,05E+08	1,00E+00	1,63E+01	1,48E-01	252,9	266,0
4	6,32E+02	6,32E+02	1,67E+05	1,20E+08	7,33E+04	1,29E+11	8,47E+11	1,65E+11	1,49E+08	1,00E+00	7,60E+01	4,97E-02	324,3	315,3
5	7,40E+02	7,40E+02	1,79E+05	9,80E+07	6,84E+04	5,01E+10	2,91E+11	5,39E+10	1,60E+08	1,00E+00	2,66E+02	2,57E-02	452,8	470,7
6	7,95E+02	7,95E+02	1,60E+05	6,14E+07	4,39E+04	2,36E+10	1,05E+11	1,74E+10	1,46E+08	1,00E+00	8,43E+02	1,21E-02	582,3	598,0
7	6,92E+02	6,92E+02	1,24E+05	2,51E+07	4,41E+04	1,15E+10	3,98E+10	6,07E+09	7,34E+07	1,00E+00	2,50E+03	5,19E-03	719,4	654,6
8	7,79E+02	7,79E+02	1,84E+05	2,58E+07	1,17E+05	8,13E+09	2,15E+10	2,96E+09	5,56E+07	1,34E+00	1,14E+04	4,10E-03	928,7	906,9
9	9,33E+02	9,33E+02	2,67E+05	1,93E+07	6,96E+05	3,98E+09	7,69E+09	9,34E+08	3,78E+07	9,67E+00	8,17E+04	1,85E-03	1095,6	1057,3
10	1,81E+03	1,81E+03	1,14E+06	3,88E+07	6,15E+06	1,78E+09	2,24E+09	2,02E+08	2,93E+07	2,44E+02	9,36E+05	9,50E-04	1875,5	1595,1
11	2,89E+03	2,89E+03	3,26E+06	4,25E+07	9,23E+06	9,55E+08	7,24E+08	4,24E+07	6,96E+06	1,44E+04	2,99E+06	6,04E-04	2455,1	2426,3
12	4,29E+03	4,29E+03	9,90E+06	2,29E+07	2,72E+06	2,75E+08	1,07E+08	2,26E+06	5,18E+05	4,94E+06	4,87E+06	2,03E-04	3525,8	3333,2
13	4,34E+03	4,34E+03	7,12E+06	4,64E+06	7,93E+05	9,21E+07	1,66E+07	[illegible]	1,67E+05	2,80E+06	4,31E+06	7,45E-05	4462,2	4118,3

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2   TDAT1 =150,00   TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,33E+02	4,33E+02	4,56E+04	2,11E+09	4,47E+03	3,43E+11	2,81E+13	7,43E+12	4,78E+05	1,00E+00	1,00E+00	1,11E+00	217,4	224,9
2	6,16E+02	6,16E+02	1,55E+05	2,20E+09	6,95E+04	3,92E+11	7,59E+12	1,86E+12	5,14E+05	1,00E+00	1,87E+00	3,24E-01	246,6	238,5
3	6,24E+02	6,24E+02	2,10E+05	3,59E+08	1,00E+05	3,40E+11	3,10E+12	6,70E+11	7,45E+07	1,00E+00	1,78E+01	1,61E-01	247,7	282,8
4	7,39E+02	7,39E+02	1,67E+05	1,56E+08	6,73E+04	1,14E+11	7,30E+11	1,41E+11	1,40E+08	1,00E+00	8,22E+01	4,83E-02	364,9	354,9
5	8,91E+02	8,91E+02	1,68E+05	7,02E+07	5,00E+04	4,04E+10	2,23E+11	4,03E+10	2,37E+08	1,00E+00	2,81E+02	2,25E-02	525,1	534,9
6	8,43E+02	8,43E+02	1,25E+05	3,60E+07	2,11E+04	1,72E+10	7,34E+10	1,19E+10	2,02E+08	1,00E+00	8,03E+02	8,17E-03	597,7	575,0
7	8,20E+02	8,20E+02	1,13E+05	2,41E+07	3,65E+04	9,68E+09	3,24E+10	4,77E+09	1,26E+08	1,00E+00	2,51E+03	4,46E-03	763,5	690,8
8	9,77E+02	9,77E+02	1,85E+05	2,65E+07	9,25E+04	6,91E+09	1,77E+10	2,32E+09	1,00E+08	1,77E+00	1,09E+04	3,56E-03	976,7	956,1
9	1,22E+03	1,22E+03	2,52E+05	2,40E+07	5,58E+05	3,24E+09	6,07E+09	6,86E+08	7,40E+07	1,51E+01	6,90E+04	1,55E-03	1167,8	1107,6
10	3,37E+03	3,37E+03	4,30E+05	6,07E+07	9,16E+06	1,19E+09	1,30E+09	5,82E+07	4,19E+07	7,97E+02	2,11E+05	8,19E-04	2683,3	2216,5
11	5,28E+03	5,28E+03	6,36E+06	9,40E+07	9,36E+06	6,22E+08	3,91E+08	2,85E+06	2,08E+06	4,49E+06	1,55E+06	5,72E-04	3695,7	3609,9
12	5,24E+03	5,24E+03	1,52E+07	4,15E+07	3,29E+06	1,76E+08	5,26E+07	1,54E+05	5,89E+05	9,37E+06	5,77E+06	1,95E-04	5004,2	4572,4
13	5,18E+03	5,18E+03	8,50E+06	7,38E+06	1,01E+06	6,48E+07	9,25E+06	2,12E+05	7,91E+05	3,32E+06	5,15E+06	7,20E-05	5791,9	5156,7

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3   TDAT1 =150,00   TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,28E+02	5,28E+02	8,86E+04	9,51E+09	1,99E+04	3,78E+11	2,55E+13	6,70E+12	1,16E+06	1,00E+00	1,00E+00	1,10E+00	229,4	245,5
2	7,24E+02	7,24E+02	2,11E+05	3,70E+09	9,46E+04	3,76E+11	5,32E+12	1,25E+12	6,26E+05	1,00E+00	5,28E+00	2,55E-01	238,4	265,3
3	9,05E+02	9,05E+02	1,60E+05	1,14E+08	4,35E+04	8,57E+10	5,45E+11	1,05E+11	2,37E+08	1,00E+00	7,80E+01	3,95E-02	386,2	387,9
4	1,02E+03	1,02E+03	9,80E+04	2,77E+06	1,34E+04	1,74E+10	8,14E+10	1,35E+10	5,51E+08	1,00E+00	3,78E+02	7,96E-03	560,6	512,3
5	1,03E+03	1,03E+03	1,13E+05	4,89E+06	2,55E+04	9,08E+09	3,07E+10	4,35E+09	3,51E+08	1,00E+00	1,91E+03	4,33E-03	762,6	706,0
6	1,56E+03	1,56E+03	1,30E+05	7,24E+06	4,05E+04	3,75E+09	8,54E+09	9,15E+08	2,60E+08	1,14E+00	7,93E+03	1,99E-03	1205,1	1074,9
7	2,23E+03	2,23E+03	2,04E+05	1,16E+07	1,32E+05	2,23E+09	3,65E+09	2,67E+08	2,27E+08	1,18E+01	2,52E+04	1,33E-03	1622,6	1510,7
8	5,14E+03	5,14E+03	5,84E+05	2,48E+08	2,18E+07	9,09E+08	9,02E+08	1,60E+07	2,51E+07	1,10E+05	3,52E+04	9,36E-04	3606,8	3126,0
9	7,05E+03	7,05E+03	2,31E+06	2,92E+08	2,93E+07	6,73E+08	5,11E+08	1,00E+00	8,43E+05	1,83E+06	9,57E+04	6,92E-04	3855,8	3333,8
10	6,47E+03	6,47E+03	9,43E+06	2,20E+08	3,35E+07	2,55E+08	7,20E+07	1,00E+00	3,88E+06	6,94E+06	2,05E+06	6,10E-04	8275,8	7348,2
11	6,13E+03	6,13E+03	1,25E+07	2,67E+08	4,06E+07	3,19E+08	9,31E+07	1,00E+00	9,68E+05	9,52E+06	2,55E+06	5,51E-04	5584,6	5309,9
12	6,17E+03	6,17E+03	1,60E+07	1,25E+08	1,96E+07	1,66E+08	3,68E+07	1,00E+00	8,80E+05	1,01E+07	5,73E+06	2,94E-04	6100,1	5553,5
13	6,58E+03	6,58E+03	2,01E+07	6,03E+07	1,06E+07	1,01E+08	1,09E+07	1,00E+00	7,99E+05	1,16E+07	8,00E+06	2,02E-04	7076,4	6500,0

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	6,63E+02	6,63E+02	8,58E+04	4,05E+10	8,59E+03	3,57E+11	2,45E+13	6,46E+12	4,00E+06	1,00E+00	1,00E+00	1,18E+00	247,8	272,4
2	8,90E+02	8,90E+02	1,84E+05	7,04E+09	5,69E+04	2,82E+11	4,31E+12	1,02E+12	8,12E+06	1,00E+00	3,96E+00	2,57E-01	310,5	330,4
3	1,13E+03	1,13E+03	1,26E+05	1,19E+04	1,59E+04	8,42E+10	5,70E+11	1,12E+11	2,54E+09	1,00E+00	3,70E+01	5,44E-02	518,1	512,2
4	1,20E+03	1,20E+03	9,38E+04	6,72E+03	1,09E+04	4,16E+10	2,40E+11	4,38E+10	3,48E+09	1,00E+00	7,07E+01	2,02E-02	482,6	447,5
5	1,31E+03	1,31E+03	8,02E+04	5,51E+03	8,35E+03	2,28E+10	1,02E+11	1,61E+10	3,49E+09	1,00E+00	1,76E+02	8,99E-03	502,2	453,7
6	1,28E+03	1,28E+03	8,01E+04	5,68E+03	6,64E+03	9,81E+09	3,51E+10	4,70E+09	1,88E+09	1,00E+00	6,31E+02	4,71E-03	712,6	666,6
7	1,66E+03	1,66E+03	8,20E+04	1,46E+04	6,33E+03	6,38E+09	1,90E+10	2,15E+09	1,67E+09	1,00E+00	1,24E+03	3,23E-03	894,1	811,8
8	2,72E+03	2,72E+03	1,63E+05	3,43E+07	2,07E+01	3,84E+09	8,24E+09	5,86E+08	8,48E+08	3,56E+00	2,02E+03	2,55E-03	1453,3	1303,8
9	5,63E+03	5,63E+03	3,24E+05	2,64E+08	1,20E+07	2,09E+09	2,83E+09	1,00E+00	1,30E+07	1,37E+03	2,23E+03	1,83E-03	2839,3	2541,0
10	6,45E+03	6,45E+03	2,64E+05	4,90E+08	8,83E+06	1,35E+09	1,53E+09	1,00E+00	1,15E+07	3,52E+03	3,19E+03	1,43E-03	3415,4	3030,4
11	7,42E+03	7,42E+03	5,75E+05	5,57E+08	1,09E+07	9,59E+08	9,07E+08	1,00E+00	8,63E+06	2,16E+05	9,26E+03	1,17E-03	3922,9	3435,9
12	6,81E+03	6,81E+03	2,69E+07	5,53E+08	3,97E+07	7,27E+08	5,72E+08	1,00E+00	3,06E+0[illegible]	2,23E+07	3,06E+06	1,02E-03	4184,5	3641,2
13	7,30E+03	7,30E+03	1,40E+08	4,68E+08	7,79E+07	2,60E+08	4,22E+05	1,00E+00	1,01E+02	1,08E+08	3,10E+07	8,86E-04	6688,3	5806,5

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	9,94E+02	9,94E+02	8,30E+04	1,52E+09	1,14E+04	3,73E+11	1,43E+13	3,67E+12	4,65E+08	1,00E+00	1,00E+00	1,12E+00	427,9	440,4
2	1,08E+03	1,08E+03	1,52E+05	1,81E+04	3,09E+04	3,21E+11	7,93E+12	1,96E+12	3,39E+09	1,00E+00	1,00E+00	5,02E-01	281,1	351,1
3	1,28E+03	1,28E+03	7,67E+04	1,43E+03	1,25E+03	9,14E+10	1,22E+12	2,85E+11	3,01E+10	1,00E+00	2,74E+00	9,10E-02	421,5	406,5
4	1,39E+03	1,39E+03	6,12E+04	2,58E+03	3,44E+03	6,82E+10	6,87E+11	1,51E+11	3,64E+10	1,00E+00	4,74E+00	4,16E-02	347,5	323,2
5	1,72E+03	1,72E+03	5,68E+04	2,44E+03	2,79E+03	5,19E+10	2,90E+11	5,12E+10	4,15E+10	1,00E+00	1,74E+01	2,38E-02	439,0	403,5
6	1,99E+03	1,99E+03	4,40E+04	2,08E+03	2,04E+03	3,11E+10	1,14E+11	1,45E+10	3,15E+10	1,00E+00	5,88E+01	1,66E-02	721,6	650,2
7	2,06E+03	2,06E+03	5,19E+04	2,27E+03	2,08E+03	2,47E+10	8,09E+10	8,88E+09	2,50E+10	1,00E+00	9,57E+01	1,28E-02	758,4	686,0
8	2,28E+03	2,28E+03	5,53E+04	2,46E+03	2,32E+03	1,79E+10	4,98E+10	4,15E+09	1,69E+10	1,00E+00	1,69E+02	9,67E-03	896,1	817,1
9	2,90E+03	2,90E+03	1,42E+05	3,26E+00	8,55E+02	1,15E+10	2,68E+10	1,57E+09	7,62E+09	1,00E+00	2,49E+02	7,56E-03	1283,9	1172,0
10	4,30E+03	4,30E+03	3,58E+05	7,07E+07	1,41E+05	6,54E+09	1,08E+10	1,60E+08	5,79E+08	2,54E+00	3,07E+02	6,11E-03	2854,5	2414,6
11	6,58E+03	6,58E+03	1,89E+07	3,31E+09	3,29E+08	3,66E+09	4,29E+09	1,00E+00	8,59E+06	1,53E+07	3,68E+05	4,75E-03	2926,1	2639,0
12	6,95E+03	6,95E+03	2,39E+08	4,33E+09	5,08E+08	1,76E+09	1,01E+09	1,00E+00	1,00E+00	1,74E+08	3,02E+07	3,09E-03	2775,1	2502,4
13	5,19E+03	5,19E+03	6,62E+08	3,60E+09	3,01E+08	7,91E+08	1,42E+00	1,00E+00	1,00E+00	3,96E+08	2,64E+08	2,22E-03	2700,8	2417,8

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PHES	TEM(1)	TEM(2)
1	1,35E+03	1,35E+03	5,95E+04	2,58E+03	3,99E+03	3,90E+11	1,01E+13	2,54E+12	3,08E+10	1,00E+00	1,00E+00	9,65E-01	497,4	533,7
2	1,40E+03	1,40E+03	4,74E+04	5,53E+03	7,45E+03	2,92E+11	6,82E+12	1,69E+12	5,07E+10	1,00E+00	1,00E+00	5,97E-01	382,5	478,7
3	1,50E+03	1,50E+03	3,62E+04	2,34E+03	6,65E+02	1,21E+11	2,05E+12	4,90E+11	8,[illegible]8E+10	1,00E+00	1,00E+00	1,22E-01	316,2	323,2
4	1,68E+03	1,68E+03	3,49E+04	2,54E+03	5,03E+02	8,79E+10	9,40E+11	2,08E+11	1,11E+11	1,00E+00	1,38E+00	6,06E-02	364,8	331,5
5	1,97E+03	1,97E+03	3,51E+04	3,21E+03	1,32E+03	8,00E+10	5,11E+11	9,56E+10	1,29E+11	1,00E+00	4,42E+00	4,33E-02	448,5	399,0
6	2,42E+03	2,42E+03	5,98E+04	3,30E+03	7,43E+03	5,33E+10	1,69E+11	2,20E+10	3,00E+10	1,00E+00	1,50E+01	3,66E-02	1099,7	987,7
7	2,71E+03	2,71E+03	7,14E+04	2,01E+03	3,87E+03	5,23E+10	1,24E+11	1,13E+10	1,55E+10	1,00E+00	2,34E+01	3,20E-02	1293,7	1163,4
8	3,10E+03	3,10E+03	8,66E+04	1,00E+00	1,00E+00	5,29E+10	9,22E+10	3,42E+09	4,61E+09	1,00E+00	3,63E+01	2,82E-02	1500,1	1344,5
9	3,37E+03	3,37E+03	1,14E+05	1,50E+08	3,63E+05	5,29E+10	7,77E+10	1,00E+00	9,33E+07	1,00E+00	4,21E+01	2,40E-02	1477,7	1332,5
10	3,60E+03	3,60E+03	4,79E+05	2,83E+09	9,44E+06	3,97E+10	5,28E+10	1,00E+00	2,73E+03	5,63E+01	5,89E+01	1,83E-02	1546,2	1395,4
11	4,39E+03	4,39E+03	1,04E+06	6,12E+09	2,25E+07	2,56E+10	2,55E+10	1,00E+00	2,33E+01	3,26E+02	1,08E+02	1,43E-02	2016,7	1812,9
12	5,02E+03	5,02E+03	3,52E+06	7,93E+09	2,31E+08	2,10E+10	1,80E+10	1,00E+00	1,00E+00	9,14E+04	4,81E+03	1,15E-02	1979,8	1773,9
13	5,67E+03	5,67E+03	8,36E+06	1,11E+10	1,02E+09	1,52E+10	1,14E+10	1,00E+00	1,00E+00	1,86E+06	9,62E+04	9,14E-03	1916,8	1711,4

Table 11. NRLHYD Results for Test Problem.

LAGRANGIAN-POINT QUANTITIES BUF(1) THROUGH BUF(22) AT AMBIENT ATMOSPHERIC CONDITIONS AND M+,TH

	HC O2	RHO ENO HE	T ELECT ENP M+	ENE UP TH	VPOINT P		EN4S T N2VIB	EN2O CO2	O	N2 GAMB
K = 1	9,000E+06	3,049E-09	1,878E+02	1,370E+04	0,	IIII	3,845E+05	1,000E+00	2,193E+11	5,006E+13
	1,343E+13	5,103E+07	1,000E+00	4,297E-04	1,652E+00	IIII	1,878E+02	2,054E+10	IIII	1,166E+02
	IIII	2,968E+09	1,370E+04	1,878E+02						
K = 2	9,350E+06	1,621E-09	1,925E+02	2,759E+04	0,	IIII	5,505E+05	1,000E+00	3,161E+11	2,662E+13
	7,042E+12	5,884E+07	1,000E+00	9,007E-03	9,052E-01	IIII	1,925E+02	1,092E+10	IIII	4,614E+02
	IIII	1,578E+09	2,759E+04	1,925E+02						
K = 3	1,000E+07	5,167E-10	2,058E+02	1,012E+05	0,	IIII	9,853E+05	1,000E+00	4,277E+11	8,484E+12
	2,081E+12	6,280E+07	1,000E+00	1,712E+00	3,124E-01	IIII	2,058E+02	3,481E+09	IIII	5,810E+03
	IIII	5,031E+08	1,012E+05	2,058E+02						
K = 4	1,063E+07	1,826E-10	2,268E+02	1,141E+05	0,	IIII	1,577E+06	1,000E+00	3,232E+11	2,999E+12
	6,496E+11	5,315E+07	1,000E+00	1,433E+01	1,244E-01	IIII	2,268E+02	1,022E+09	IIII	6,696E+03
	IIII	1,778E+08	1,141E+05	2,268E+02						
K = 5	1,132E+07	6,110E-11	2,790E+02	1,299E+05	0,	IIII	2,444E+06	1,000E+00	1,494E+11	1,003E+12
	1,966E+11	3,945E+07	1,000E+00	7,871E+01	5,200E-02	IIII	2,790E+02	2,516E+08	IIII	7,047E+03
	IIII	5,950E+07	1,298E+05	2,790E+02						
K = 6	1,210E+07	2,192E-11	4,298E+02	1,491E+05	0,	IIII	3,606E+06	1,000E+00	5,892E+10	3,598E+11
	6,810E+10	2,953E+07	1,000E+00	2,360E+02	2,514E-02	IIII	4,298E+02	4,777E+07	IIII	6,024E+03
	IIII	2,339E+07	1,489E+05	3,739E+02						
K = 7	1,295E+07	8,863E-12	6,740E+02	1,718E+05	0,	IIII	4,973E+06	1,000E+00	3,081E+10	1,444E+11
	2,503E+10	2,465E+07	1,000E+00	7,576E+02	1,387E-02	IIII	6,740E+02	1,348E+07	IIII	5,121E+03
	IIII	1,791E+07	1,710E+05	5,017E+02						
K = 8	1,405E+07	3,809E-12	8,977E+02	2,045E+05	0,	IIII	6,591E+06	1,000E+00	1,692E+10	6,111E+10
	9,717E+09	2,054E+07	1,000E+00	2,646E+03	7,812E-03	IIII	8,977E+02	4,033E+06	IIII	5,430E+03
	IIII	1,410E+07	2,018E+05	6,445E+02						
K = 9	1,550E+07	1,670E-12	1,131E+03	2,530E+05	0,	IIII	7,966E+06	1,000E+00	9,485E+09	2,612E+10
	3,797E+09	1,616E+07	1,000E+00	9,315E+03	4,357E-03	IIII	1,131E+03	1,202E+06	IIII	6,465E+03
	IIII	1,129E+07	2,436E+05	8,002E+02						
K =10	1,760E+07	6,827E-13	1,392E+03	3,323E+05	0,	IIII	8,456E+06	1,000E+00	5,099E+09	1,022E+10
	1,337E+09	1,143E+07	1,000E+00	3,796E+04	2,243E-03	IIII	1,392E+03	3,081E+05	IIII	8,373E+03
	IIII	9,015E+06	2,943E+05	9,735E+02						
K =11	2,070E+07	2,531E-13	1,670E+03	4,598E+05	0,	IIII	7,911E+06	1,000E+00	2,573E+09	3,499E+09
	4,024E+08	6,864E+06	1,000E+00	1,604E+05	1,030E-03	IIII	1,670E+03	6,290E+04	IIII	9,875E+03
	IIII	7,159E+06	2,994E+05	1,148E+03						
K =12	2,510E+07	8,586E-14	1,932E+03	6,217E+05	0,	IIII	3,916E+06	1,000E+00	1,215E+09	1,030E+09
	1,012E+08	3,331E+06	1,000E+00	4,520E+05	4,211E-04	IIII	1,932E+03	9,858E+03	IIII	6,571E+03
	IIII	5,685E+06	1,697E+05	1,292E+03						
K =13	3,120E+07	2,620E-14	2,161E+03	6,572E+05	0,	IIII	9,241E+05	1,000E+00	5,166E+08	2,430E+08
	1,965E+07	1,225E+06	1,000E+00	6,121E+05	1,507E-04	IIII	2,161E+03	1,063E+03	IIII	1,655E+03
	IIII	4,473E+06	4,509E+04	1,386E+03						
K =14	3,970E+07	6,825E-15	2,363E+03	4,292E+05	0,	IIII	1,506E+05	1,000E+00	1,806E+08	3,961E+07
	2,487E+06	3,040E+05	1,000E+00	4,224E+05	4,501E-05	IIII	2,363E+03	6,272E+01	IIII	1,495E+02
	IIII	3,396E+06	6,804E+03	1,432E+03						

Table 11 continues through page 190.

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (1, 1) = 1

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	D	N2
	O2	FNO	ENP	OP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)0	HE	M+	TH						
K = 1	9,000E+06	3,049E-09	4,494E+02	4,179E+09	0,	IIII	2,243E+09	1,601E+08	2,169E+11	5,006E+13
	1,343E+13	5,102E+07	2,522E+01	1,438E+07	1,669E+00	IIII	4,494E+02	2,054E+10	IIII	1,166E+02
	IIII	2,968E+09	4,165E+09	1,897E+02						
K = 2	9,350E+06	1,621E-09	4,728E+02	3,226E+09	0,	IIII	1,729E+09	1,303E+08	3,142E+11	2,601E+13
	7,041E+12	5,883E+07	5,227E+01	3,002E+07	9,165E-01	IIII	4,728E+02	1,092E+10	IIII	4,614E+02
	IIII	1,578E+09	3,196E+09	1,953E+02						
K = 3	1,000E+07	5,167E-10	5,599E+02	3,132E+09	0,	IIII	1,662E+09	1,593E+08	4,258E+11	8,482E+12
	2,081E+12	6,279E+07	2,802E+02	1,278E+08	3,255E-01	IIII	5,599E+02	3,480E+09	IIII	5,810E+03
	IIII	5,029E+08	3,005E+09	2,143E+02						
K = 4	1,063E+07	1,826E-10	5,984E+02	1,637E+09	0,	IIII	8,614E+08	1,082E+08	3,225E+11	2,997E+12
	6,491E+11	5,313E+07	6,500E+02	1,332E+08	1,323E-01	IIII	5,984E+02	1,022E+09	IIII	6,696E+03
	IIII	1,777E+08	1,503E+09	2,410E+02						
K = 5	1,132E+07	6,110E-11	6,341E+02	7,544E+08	0,	IIII	3,956E+08	5,772E+07	1,505E+11	1,003E+12
	1,956E+11	3,942E+07	1,366E+03	8,347E+07	5,933E-02	IIII	6,341E+02	2,514E+08	IIII	7,047E+03
	IIII	5,947E+07	6,709E+08	3,178E+02						
K = 6	1,210E+07	2,192E-11	7,327E+02	5,590E+08	0,	IIII	2,938E+08	4,462E+07	6,044E+10	3,594E+11
	6,706E+10	2,929E+07	4,139E+03	6,764E+07	3,212E-02	IIII	7,327E+02	4,772E+07	IIII	6,024E+03
	IIII	2,336E+07	4,914E+08	4,761E+02						
K = 7	1,295E+07	8,863E-12	7,877E+02	3,124E+08	0,	IIII	1,762E+08	3,314E+07	3,178E+10	1,441E+11
	2,438E+10	2,461E+07	1,747E+06	4,774E+07	1,815E-02	IIII	7,877E+02	1,345E+07	IIII	5,121E+03
	IIII	1,788E+07	2,629E+08	6,534E+02						
K = 8	1,405E+07	3,809E-12	6,884E+02	7,248E+07	0,	IIII	5,287E+07	1,153E+07	1,746E+10	6,105E+10
	9,412E+09	2,052E+07	2,389E+06	1,329E+07	9,567E-03	IIII	6,884E+02	4,029E+06	IIII	5,430E+03
	IIII	1,409E+07	5,680E+07	7,860E+02						
K = 9	1,550E+07	1,670E-12	7,628E+02	5,028E+07	0,	IIII	3,556E+07	6,264E+06	9,716E+09	2,609E+10
	3,658E+09	1,614E+07	2,265E+06	1,125E+07	5,221E-03	IIII	7,628E+02	1,200E+06	IIII	6,465E+03
	IIII	1,128E+07	3,677E+07	9,544E+02						
K =10	1,760E+07	6,827E-13	9,080E+02	4,024E+07	0,	IIII	2,217E+07	1,035E+06	5,175E+09	1,020E+10
	1,283E+09	1,141E+07	6,700E+06	9,553E+06	2,641E-03	IIII	9,080E+02	3,074E+05	IIII	8,373E+03
	IIII	8,995E+06	2,399E+07	1,141E+03						
K =11	2,070E+07	2,531E-13	1,726E+03	9,345E+07	0,	IIII	3,856E+07	1,000E+00	2,564E+09	3,446E+09
	3,786E+08	6,768E+06	3,644E+07	1,764E+07	1,511E-03	IIII	1,728E+03	6,195E+04	IIII	9,875E+03
	IIII	7,051E+06	3,938E+07	1,650E+03						
K =12	2,510E+07	8,586E-14	2,364E+03	5,397E+07	0,	IIII	2,329E+07	1,000E+00	1,203E+09	9,992E+08
	9,363E+07	3,242E+06	2,561E+07	1,200E+07	7,055E-04	IIII	2,364E+03	9,566E+03	IIII	6,571E+03
	IIII	5,517E+06	1,636E+07	2,092E+03						
K =13	3,120E+07	2,620E-14	4,634E+03	4,412E+07	0,	IIII	1,527E+07	1,000E+00	4,993E+08	2,204E+08
	1,694E+07	1,123E+06	2,067E+07	1,320E+07	4,200E-04	IIII	4,634E+03	9,639E+02	IIII	1,655E+03
	IIII	4,058E+06	1,024E+07	3,542E+03						
K =14	3,970E+07	6,825E-15	6,862E+03	1,804E+07	0,	IIII	4,179E+06	1,000E+00	1,703E+08	3,294E+07
	1,967E+06	2,585E+05	6,197E+06	8,678E+06	1,737E-04	IIII	6,862E+03	5,216E+01	IIII	1,495E+02
	IIII	2,824E+06	3,163E+06	4,923E+03						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (2, 1) = 2

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	O	N2
	O2	END	ENP	OP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,000E+06	3,049E-09	4,659E+02	5,454E+09	0,	IIII	2,927E+09	2,089E+08	2,161E+11	5,006E+13
	1,343E+13	5,102E+07	3,292E+01	1,877E+07	1,675E+00	IIII	4,659E+02	2,054E+10	IIII	1,166E+02
	IIII	2,968E+09	5,435E+09	1,903E+02						
K = 2	9,350E+06	1,621E-09	5,301E+02	6,990E+09	0,	IIII	3,745E+09	2,824E+08	3,120E+11	2,661E+13
	7,041E+12	5,883E+07	1,133E+02	6,504E+07	9,321E-01	IIII	5,301E+02	1,092E+10	IIII	4,614E+02
	IIII	1,578E+09	6,925E+09	1,985E+02						
K = 3	1,000E+07	5,167E-10	6,362E+02	6,493E+09	0,	IIII	3,405E+09	3,264E+08	4,237E+11	8,479E+12
	2,080E+12	6,277E+07	5,741E+02	3,363E+08	3,394E-01	IIII	6,362E+02	3,479E+09	IIII	5,810E+03
	IIII	5,028E+08	6,156E+09	2,232E+02						
K = 4	1,063E+07	1,826E-10	6,214E+02	2,020E+09	0,	IIII	1,063E+09	1,335E+08	3,236E+11	2,997E+12
	6,483E+11	5,312E+07	8,022E+02	1,644E+08	1,371E-01	IIII	6,214E+02	1,021E+09	IIII	6,696E+03
	IIII	1,777E+08	1,855E+09	2,497E+02						
K = 5	1,132E+07	6,110E-11	7,336E+02	1,567E+09	0,	IIII	8,192E+08	1,199E+08	1,527E+11	1,002E+12
	1,943E+11	3,940E+07	2,838E+03	1,734E+08	6,946E-02	IIII	7,336E+02	2,513E+08	IIII	7,047E+03
	IIII	5,943E+07	1,394E+09	3,712E+02						
K = 6	1,210E+07	2,192E-11	8,685E+02	1,168E+09	0,	IIII	6,247E+08	1,009E+08	6,195E+10	3,589E+11
	6,600E+10	2,926E+07	1,354E+06	1,413E+08	3,955E-02	IIII	8,685E+02	4,766E+07	IIII	6,024E+03
	IIII	2,333E+07	1,026E+09	5,839E+02						
K = 7	1,295E+07	8,863E-12	8,338E+02	4,024E+08	0,	IIII	2,475E+08	5,336E+07	3,268E+10	1,440E+11
	2,389E+10	2,460E+07	6,712E+06	6,072E+07	2,094E-02	IIII	8,338E+02	1,345E+07	IIII	5,121E+03
	IIII	1,787E+07	3,350E+08	7,516E+02						
K = 8	1,405E+07	3,809E-12	8,082E+02	1,519E+08	0,	IIII	9,644E+07	2,025E+07	1,780E+10	6,099E+10
	9,203E+09	2,051E+07	6,516E+06	2,753E+07	1,089E-02	IIII	8,082E+02	4,025E+06	IIII	5,430E+03
	IIII	1,407E+07	1,178E+08	8,915E+02						
K = 9	1,550E+07	1,670E-12	9,333E+02	1,147E+08	0,	IIII	5,846E+07	7,107E+06	9,838E+09	2,605E+10
	3,570E+09	1,612E+07	1,368E+07	2,318E+07	5,864E-03	IIII	9,333E+02	1,198E+06	IIII	6,465E+03
	IIII	1,126E+07	7,787E+07	1,068E+03						
K =10	1,760E+07	6,827E-13	1,147E+03	9,047E+07	0,	IIII	4,152E+07	9,502E+05	5,200E+09	1,017E+10
	1,249E+09	1,138E+07	1,311E+07	2,037E+07	2,978E-03	IIII	1,147E+03	3,065E+05	IIII	8,373E+03
	IIII	8,970E+06	5,699E+07	1,280E+03						
K =11	2,070E+07	2,531E-13	2,851E+03	2,623E+08	0,	IIII	9,708E+07	1,000E+00	2,529E+09	3,343E+09
	3,567E+08	6,593E+06	1,253E+08	3,857E+07	2,429E-03	IIII	2,851E+03	6,009E+04	IIII	9,875E+03
	IIII	6,840E+06	9,834E+07	2,553E+03						
K =12	2,510E+07	8,566E-14	4,186E+03	1,524E+08	0,	IIII	6,069E+07	1,000E+00	1,177E+09	9,397E+08
	6,539E+07	3,073E+06	8,129E+07	2,879E+07	1,324E-03	IIII	4,186E+03	8,997E+03	IIII	6,571E+03
	IIII	5,188E+06	4,228E+07	3,693E+03						
K =13	3,120E+07	2,620E-14	7,233E+03	1,039E+08	0,	IIII	3,083E+07	1,000E+00	4,733E+08	1,917E+08
	1,428E+07	9,911E+05	4,902E+07	3,103E+07	8,579E-04	IIII	7,233E+03	8,385E+02	IIII	1,655E+03
	IIII	3,530E+06	2,384E+07	6,673E+03						
K =14	3,970E+07	6,825E-15	8,726E+03	3,133E+07	0,	IIII	6,648E+06	1,000E+00	1,621E+08	2,833E+07
	1,651E+06	2,276E+05	1,070E+07	1,518E+07	2,937E-04	IIII	8,726E+03	4,486E+01	IIII	1,495E+02
	IIII	2,429E+06	5,440E+06	7,965E+03						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (3, 1) = 3

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	O	N2
	O2	ENO	ENP	OP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,000E+06	3,049E-09	5,288E+02	1,294E+10	0,	IIII	6,946E+09	4,959E+08	2,118E+11	5,005E+13
	1,343E+13	5,101E+07	7,813E+01	4,455E+07	1,706E+00	IIII	5,288E+02	2,053E+10	IIII	1,166E+02
	IIII	2,968E+09	1,290E+10	1,937E+02						
K = 2	9,350E+06	1,621E-09	6,193E+02	1,759E+10	0,	IIII	9,427E+09	7,108E+08	3,058E+11	2,660E+13
	7,036E+12	5,861E+07	2,851E+02	1,641E+08	9,761E-01	IIII	6,193E+02	1,091E+10	IIII	4,614E+02
	IIII	1,577E+09	1,743E+10	2,077E+02						
K = 3	1,000E+07	5,167E-10	7,187E+02	1,203E+10	0,	IIII	6,393E+09	6,128E+08	4,208E+11	8,475E+12
	2,079E+12	6,273E+07	1,078E+03	4,679E+08	3,643E-01	IIII	7,187E+02	3,477E+09	IIII	5,810E+03
	IIII	5,025E+08	1,156E+10	2,392E+02						
K = 4	1,063E+07	1,826E-10	7,354E+02	4,737E+09	0,	IIII	2,490E+09	3,130E+08	3,277E+11	2,995E+12
	6,449E+11	5,309E+07	1,881E+03	3,855E+08	1,629E-01	IIII	7,354E+02	1,021E+09	IIII	6,696E+03
	IIII	1,776E+08	4,351E+09	2,959E+02						
K = 5	1,132E+07	6,110E-11	9,030E+02	3,797E+09	0,	IIII	1,981E+09	2,906E+08	1,584E+11	1,001E+12
	1,901E+11	3,933E+07	6,876E+03	4,201E+08	9,776E-02	IIII	9,030E+02	2,509E+08	IIII	7,047E+03
	IIII	5,933E+07	3,377E+09	5,197E+02						
K = 6	1,210E+07	2,192E-11	1,003E+03	2,017E+09	0,	IIII	1,142E+09	2,072E+08	6,579E+10	3,582E+11
	6,366E+10	2,921E+07	1,400E+07	2,429E+08	5,447E-02	IIII	1,003E+03	4,757E+07	IIII	6,024E+03
	IIII	2,328E+07	1,761E+09	7,992E+02						
K = 7	1,295E+07	8,863E-12	8,921E+02	5,382E+08	0,	IIII	3,447E+08	7,683E+07	3,459E+10	1,439E+11
	2,287E+10	2,459E+07	1,980E+07	7,927E+07	2,652E-02	IIII	8,921E+02	1,343E+07	IIII	5,121E+03
	IIII	1,785E+07	4,392E+08	9,468E+02						
K = 8	1,405E+07	3,809E-12	1,079E+03	4,485E+08	0,	IIII	2,084E+08	2,376E+07	1,851E+10	6,081E+10
	8,727E+09	2,045E+07	5,948E+07	7,155E+07	1,425E-02	IIII	1,079E+03	4,013E+06	IIII	5,430E+03
	IIII	1,403E+07	3,174E+08	1,157E+03						
K = 9	1,550E+07	1,670E-12	1,333E+03	3,624E+08	0,	IIII	1,437E+08	1,746E+06	1,002E+10	2,590E+10
	3,376E+09	1,604E+07	5,826E+07	6,189E+07	7,623E-03	IIII	1,333E+03	1,192E+06	IIII	6,465E+03
	IIII	1,120E+07	2,422E+08	1,374E+03						
K =10	1,760E+07	6,827E-13	1,913E+03	3,473E+08	0,	IIII	1,111E+08	1,000E+00	5,203E+09	1,003E+10
	1,165E+09	1,123E+07	1,047E+08	6,016E+07	4,291E-03	IIII	1,913E+03	3,022E+05	IIII	8,373E+03
	IIII	8,844E+06	1,824E+08	1,803E+03						
K =11	2,070E+07	2,531E-13	5,861E+03	9,116E+08	0,	IIII	3,342E+08	1,000E+00	2,395E+09	2,939E+09
	2,931E+08	5,897E+06	5,132E+08	1,164E+08	6,750E-03	IIII	5,861E+03	5,283E+04	IIII	9,875E+03
	IIII	6,013E+06	2,820E+08	6,326E+03						
K =12	2,510E+07	8,586E-14	8,265E+03	5,173E+08	0,	IIII	1,666E+08	1,000E+00	1,056E+09	7,402E+08
	6,277E+07	2,494E+06	2,795E+08	1,000E+08	4,062E-03	IIII	8,265E+03	7,086E+03	IIII	6,571E+03
	IIII	4,087E+06	1,379E+08	9,864E+03						
K =13	3,120E+07	2,620E-14	1,059E+04	2,323E+08	0,	IIII	5,678E+07	1,000E+00	4,165E+08	1,361E+08
	9,536E+06	7,307E+05	1,109E+08	7,387E+07	2,028E-03	IIII	1,059E+04	5,952E+02	IIII	1,655E+03
	IIII	2,506E+06	4,752E+07	1,431E+04						
K =14	3,970E+07	6,825E-15	1,094E+04	5,417E+07	0,	IIII	9,911E+06	1,000E+00	1,481E+08	2,127E+07
	1,187E+06	1,781E+05	1,857E+07	2,712E+07	5,269E-04	IIII	1,094E+04	3,367E+01	IIII	1,495E+02
	IIII	1,823E+06	8,481E+06	1,362E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (4, 1) = 4

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	O	N2
	O2	END	ENP	OP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,000E+06	3,049E-09	6,440E+02	4,086E+10	0,	IIII	2,193E+10	1,566E+09	1,957E+11	5,003E+13
	1,342E+13	5,099E+07	2,466E+02	1,407E+08	1,821E+00	IIII	6,440E+02	2,052E+10	IIII	1,166E+02
	IIII	2,966E+09	4,072E+10	2,066E+02						
K = 2	9,350E+06	1,621E-09	7,841E+02	5,623E+10	0,	IIII	3,009E+10	2,269E+09	2,832E+11	2,657E+13
	7,030E+12	5,874E+07	9,101E+02	5,846E+08	1,138E+00	IIII	7,841E+02	1,090E+10	IIII	4,614E+02
	IIII	1,576E+09	5,564E+10	2,411E+02						
K = 3	1,000E+07	5,167E-10	8,318E+02	2,309E+10	0,	IIII	1,227E+10	1,176E+09	4,200E+11	8,466E+12
	2,073E+12	6,267E+07	2,069E+03	8,982E+08	4,257E-01	IIII	8,318E+02	3,473E+09	IIII	5,810E+03
	IIII	5,020E+08	2,219E+10	2,786E+02						
K = 4	1,063E+07	1,826E-10	9,654E+02	1,459E+10	0,	IIII	7,665E+09	9,640E+08	3,506E+11	2,968E+12
	6,285E+11	5,295E+07	5,794E+03	1,187E+09	2,766E-01	IIII	9,654E+02	1,018E+09	IIII	6,696E+03
	IIII	1,771E+08	1,340E+10	4,984E+02						
K = 5	1,132E+07	6,110E-11	1,245E+03	1,127E+10	0,	IIII	6,077E+09	9,669E+08	1,781E+11	9,949E+11
	1,768E+11	3,912E+07	2,544E+07	1,246E+09	1,937E-01	IIII	1,245E+03	2,494E+08	IIII	7,047E+03
	IIII	5,899E+07	1,000E+10	1,015E+03						
K = 6	1,210E+07	2,192E-11	1,067E+03	2,551E+09	0,	IIII	1,660E+09	3,639E+08	7,745E+10	3,577E+11
	5,760E+10	2,920E+07	8,006E+07	3,013E+08	8,859E-02	IIII	1,067E+03	4,749E+07	IIII	6,024E+03
	IIII	2,325E+07	2,169E+09	1,285E+03						
K = 7	1,295E+07	8,863E-12	1,286E+03	1,828E+09	0,	IIII	9,580E+08	1,504E+08	3,881E+10	1,430E+11
	2,020E+10	2,446E+07	1,664E+08	2,498E+08	4,555E-02	IIII	1,286E+03	1,335E+07	IIII	5,121E+03
	IIII	1,774E+07	1,412E+09	1,598E+03						
K = 8	1,405E+07	3,809E-12	1,855E+03	1,946E+09	0,	IIII	7,300E+08	1,000E+00	1,977E+10	5,990E+10
	7,503E+09	2,017E+07	3,693E+08	2,577E+08	2,585E-02	IIII	1,855E+03	3,953E+06	IIII	5,430E+03
	IIII	1,382E+07	1,320E+09	2,043E+03						
K = 9	1,550E+07	1,670E-12	4,554E+03	4,457E+09	0,	IIII	1,213E+09	1,000E+00	9,572E+09	2,351E+10
	2,565E+09	1,460E+07	2,078E+09	4,334E+08	3,067E-02	IIII	4,554E+03	1,081E+06	IIII	6,465E+03
	IIII	1,016E+07	1,946E+09	4,883E+03						
K =10	1,760E+07	6,827E-13	6,522E+03	3,199E+09	0,	IIII	9,149E+08	1,000E+00	4,631E+09	8,348E+09
	8,121E+08	9,509E+06	1,677E+09	3,526E+08	2,194E-02	IIII	6,522E+03	2,516E+05	IIII	8,373E+03
	IIII	7,362E+06	1,169E+09	7,703E+03						
K =11	2,070E+07	2,531E-13	1,261E+04	3,968E+09	0,	IIII	1,001E+09	1,000E+00	1,639E+09	1,334E+09
	1,083E+08	2,939E+06	2,441E+09	6,274E+08	2,676E-02	IIII	1,261E+04	2,398E+04	IIII	9,875E+03
	IIII	2,730E+06	8,997E+08	1,785E+04						
K =12	2,510E+07	8,586E-14	1,384E+04	1,655E+09	0,	IIII	3,192E+08	1,000E+00	6,988E+08	2,459E+08
	1,711E+07	9,395E+05	9,671E+08	4,000E+08	1,518E-02	IIII	1,384E+04	2,354E+03	IIII	6,571E+03
	IIII	1,358E+06	2,877E+08	2,963E+04						
K =13	3,120E+07	2,620E-14	1,403E+04	4,809E+08	0,	IIII	7,845E+07	1,000E+00	3,046E+08	5,168E+07
	3,136E+06	3,237E+05	2,344E+08	1,749E+08	5,402E-03	IIII	1,403E+04	2,260E+02	IIII	1,655E+03
	IIII	9,513E+05	7,167E+07	3,520E+04						
K =14	3,970E+07	6,825E-15	1,322E+04	9,195E+07	0,	IIII	1,282E+07	1,000E+00	1,245E+08	1,188E+07
	6,120E+05	1,089E+05	3,153E+07	4,896E+07	9,993E-04	IIII	1,322E+04	1,881E+01	IIII	1,495E+02
	IIII	1,018E+06	1,146E+07	2,479E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (5, 1) = 5

	HC	RHO	T ELECT	ENE	VCENTR	VEL	EN4S	EN2D	O	N2
	O2	END	ENP	UP	P	Q	T N2VIB	CO2		QAMB
	(HTOP)O	HE	M+	TH						
K = 1	9,000F+06	3,049E-09	8,819E+02	1,726E+11	0,	IIII	9,264F+10	6,614E+09	1,194E+11	4,992E+13
	1,340F+13	5,089E+07	1,042E+03	5,949E+08	2,373E+00	IIII	8,819E+02	2,048E+10	IIII	1,166E+02
	IIII	2,960E+09	1,721E+11	2,673E+02						
K = 2	9,350F+06	1,621E-09	1,063F+03	1,815E+11	0,	IIII	9,724E+10	7,333E+09	2,129E+11	2,647E+13
	7,003F+12	5,852E+07	2,941E+03	1,689E+09	1,674E+00	IIII	1,063E+03	1,086E+10	IIII	4,614E+02
	IIII	1,570E+09	1,798E+11	3,512E+02						
K = 3	1,000F+07	5,167E-10	1,099E+03	6,460E+10	0,	IIII	3,433F+10	3,291E+09	4,756E+11	8,434E+12
	2,025F+12	6,243E+07	5,790E+03	2,513E+09	7,983E-01	IIII	1,099E+03	3,460E+09	IIII	5,810E+03
	IIII	5,001E+08	6,208E+10	5,173E+02						
K = 4	1,063F+07	1,826E-10	1,590E+03	6,524E+10	0,	IIII	3,431E+10	4,332E+09	4,773E+11	2,949E+12
	5,399E+11	5,228E+07	1,738E+06	5,309E+09	9,264E-01	IIII	1,590F+03	1,005E+09	IIII	6,696E+03
	IIII	1,749E+08	5,993E+10	1,623E+03						
K = 5	1,132F+07	6,110E-11	1,716E+03	2,660E+10	0,	IIII	1,604E+10	3,138E+09	2,557E+11	9,820E+11
	1,305F+11	3,873E+07	5,049E+08	2,910E+09	5,363E-01	IIII	1,716E+03	2,462E+08	IIII	7,047E+03
	IIII	5,823E+07	2,318E+10	2,714E+03						
K = 6	1,210E+07	2,192E-11	1,894E+03	1,213E+10	0,	IIII	6,774E+09	1,080E+09	1,079E+11	3,505E+11
	3,792E+10	2,872E+07	7,916E+08	1,347E+09	2,559E-01	IIII	1,894E+03	4,654E+07	IIII	6,024E+03
	IIII	2,278E+07	9,993E+09	3,545E+03						
K = 7	1,295F+07	8,863E-12	3,830F+03	1,846E+10	0,	IIII	6,025E+09	1,000E+00	4,538E+10	1,330E+11
	1,132F+10	2,286E+07	5,629E+09	1,815F+09	1,730E-01	IIII	3,830E+03	1,242E+07	IIII	5,121E+03
	IIII	1,650E+07	1,102E+10	5,518E+03						
K = 8	1,405E+07	3,809E-12	1,116E+04	5,116E+10	0,	IIII	9,915E+09	1,000E+00	1,088E+10	3,297E+10
	2,054F+09	1,131E+07	2,979E+10	4,787F+09	2,528E-01	IIII	1,116E+04	2,176E+06	IIII	5,430E+03
	IIII	7,607E+06	1,658E+10	1,177E+04						
K = 9	1,550F+07	1,670E-12	1,414E+04	5,038E+10	0,	IIII	5,149E+09	1,000E+00	3,049E+09	2,489E+09
	1,162F+08	1,836E+06	3,657E+10	8,238E+09	1,784E-01	IIII	1,414E+04	1,145E+05	IIII	6,465E+03
	IIII	1,076E+06	5,574F+09	9,479E+03						
K =10	1,760F+07	6,827E-13	1,407E+04	2,229E+10	0,	IIII	1,849E+09	1,000E+00	1,177E+09	4,073E+08
	2,107E+07	8,211E+05	1,572E+10	4,486E+09	8,200E-02	IIII	1,407E+04	1,228E+04	IIII	8,373E+03
	IIII	3,592E+05	2,079E+09	1,089E+04						
K =11	2,070F+07	2,531E-13	1,421E+04	9,206E+09	0,	IIII	2,895E+08	1,000E+00	3,459E+06	4,606E+06
	2,099E+05	8,094E+04	6,167E+09	2,491E+09	3,934E-02	IIII	1,421E+04	8,313E+01	IIII	9,875E+03
	IIII	9,424E+03	5,478E+08	1,566E+04						
K =12	2,510F+07	8,586E-14	1,449E+04	3,023E+09	0,	IIII	9,833E+07	1,000E+00	1,896E+08	1,559E+06
	7,133E+04	4,358E+04	1,791E+09	1,057E+09	1,847E-02	IIII	1,449E+04	1,522E+01	IIII	6,571E+03
	IIII	8,608E+03	1,744E+08	2,718E+04						
K =13	3,120E+07	2,620E-14	1,549E+04	7,876E+08	0,	IIII	4,397E+07	1,000E+00	1,523E+08	3,286E+06
	1,482F+05	4,460E+04	3,825F+08	3,500E+08	1,001E-02	IIII	1,549E+04	1,444E+01	IIII	1,655E+03
	IIII	6,050E+04	5,504F+07	6,109E+04						
K =14	3,970F+07	6,825E-15	1,502E+04	1,377E+08	0,	IIII	1,276F+07	1,000E+00	9,457E+07	4,001E+06
	1,812E+05	4,907E+04	4,637E+07	7,882E+07	1,874E-03	IIII	1,502E+04	6,336E+00	IIII	1,495E+02
	IIII	3,451E+05	1,250E+07	4,610E+04						

INPUT CELL QUANTITIES BUF(1) THROUGH BUF(22) AND M+,TH FOR CHEMISTRY AT TIME = 0,00

COLUMN (6, 1) = 6

	HC O2 (HTOP)0	RHO END HE	T ELECT ENP M+	ENE OP TH	VCENTR P	VEL Q	EN49 T N2VIB	EN2D CO2	O	N2 QAMB
K = 1	9,000E+06	3,049E-09	1,133E+03	4,199E+11	0,	IIII	2,692E+11	6,008E+10	1,000E+00	4,969E+13
	1,333E+13	5,064E+07	2,871E+03	1,727E+09	3,732E+00	IIII	1,133E+03	2,038E+10	IIII	1,166E+02
	IIII	2,946E+09	4,182E+11	4,164E+02						
K = 2	9,350E+06	1,621E-09	1,302E+03	3,400E+11	0,	IIII	1,822E+11	1,374E+10	1,559E+11	2,635E+13
	6,952E+12	5,825E+07	5,509E+03	3,164E+09	2,438E+00	IIII	1,302E+03	1,081E+10	IIII	4,614E+02
	IIII	1,562E+09	3,368E+11	5,063E+02						
K = 3	1,000E+07	5,167E-10	1,618E+03	1,925E+11	0,	IIII	1,023E+11	9,808E+09	7,308E+11	8,336E+12
	1,835E+12	6,170E+07	1,725E+04	7,489E+09	2,216E+00	IIII	1,618E+03	3,420E+09	IIII	5,810E+03
	IIII	4,943E+08	1,850E+11	1,404E+03						
K = 4	1,063E+07	1,826E-10	3,431E+03	3,349E+11	0,	IIII	3,026E+11	8,775E+10	6,809E+11	2,649E+12
	3,262E+11	5,079E+07	4,601E+10	2,682E+10	3,604E+00	IIII	3,431E+03	9,030E+08	IIII	6,696E+03
	IIII	1,571E+08	2,621E+11	5,695E+03						
K = 5	1,132E+07	6,110E-11	4,966E+03	2,237E+11	0,	IIII	2,155E+11	6,341E+10	2,705E+11	7,625E+11
	4,768E+10	3,803E+07	4,664E+10	2,063E+10	2,104E+00	IIII	4,966E+03	1,912E+08	IIII	7,047E+03
	IIII	4,521E+07	1,564E+11	8,925E+03						
K = 6	1,210E+07	2,192E-11	1,061E+04	2,797E+11	0,	IIII	1,100E+11	1,000E+00	2,523E+10	1,742E+11
	5,461E+09	2,073E+07	1,208E+11	1,861E+10	1,396E+00	IIII	1,061E+04	2,314E+07	IIII	6,024E+03
	IIII	1,132E+07	1,404E+11	1,201E+04						
K = 7	1,295E+07	8,863E-12	1,305E+04	3,404E+11	0,	IIII	5,891E+09	1,000E+00	2,030E+09	7,034E+08
	7,181E+06	2,207E+05	2,615E+11	5,890E+10	1,071E+00	IIII	1,305E+04	6,566E+04	IIII	5,121E+03
	IIII	8,725E+04	1,994E+10	9,505E+03						
K = 8	1,405E+07	3,809E-12	1,161E+04	1,586E+11	0,	IIII	1,000E+00	1,000E+00	1,000E+00	1,000E+00
	1,000E+00	1,000E+00	1,222E+11	3,638E+10	5,083E-01	IIII	1,161E+04	1,000E+00	IIII	5,430E+03
	IIII	1,000E+00	1,000E+00	1,161E+04						
K = 9	1,550E+07	1,670E-12	1,161E+04	6,937E+10	0,	IIII	1,000E+00	1,000E+00	1,000E+00	1,000E+00
	1,000E+00	1,000E+00	5,227E+10	1,709E+10	2,223E-01	IIII	1,161E+04	1,000E+00	IIII	6,465E+03
	IIII	1,000E+00	1,000E+00	1,161E+04						
K =10	1,760E+07	6,827E-13	1,161E+04	2,825E+10	0,	IIII	1,000E+00	1,000E+00	1,000E+00	1,000E+00
	1,000E+00	1,000E+00	2,047E+10	7,786E+09	9,054E-02	IIII	1,161E+04	1,000E+00	IIII	8,373E+03
	IIII	1,000E+00	1,000E+00	1,161E+04						
K =11	2,070E+07	2,531E-13	1,161E+04	1,040E+10	0,	IIII	1,000E+00	1,000E+00	1,000E+00	1,000E+00
	1,000E+00	1,000E+00	7,014E+09	3,385E+09	3,332E-02	IIII	1,161E+04	1,000E+00	IIII	9,875E+03
	IIII	1,000E+00	1,000E+00	1,161E+04						
K =12	2,510E+07	8,586E-14	1,161E+04	3,489E+09	0,	IIII	1,000E+00	1,000E+00	1,000E+00	1,000E+00
	1,000E+00	1,000E+00	2,067E+09	1,422E+09	1,118E-02	IIII	1,161E+04	1,000E+00	IIII	6,571E+03
	IIII	1,000E+00	1,000E+00	1,161E+04						
K =13	3,120E+07	2,620E-14	1,369E+04	9,640E+08	0,	IIII	1,064E+07	2,114E+06	4,692E+07	2,567E+04
	8,847E+02	3,881E+03	4,532E+08	4,887E+08	1,034E-02	IIII	1,369E+04	6,256E-01	IIII	1,655E+03
	IIII	4,731E+02	2,214E+07	6,027E+04						
K =14	3,970E+07	6,825E-15	1,553E+04	1,609E+08	0,	IIII	1,083E+07	1,000E+00	7,883E+07	1,884E+06
	7,785E+04	2,783E+04	5,358E+07	9,580E+07	2,414E-03	IIII	1,553E+04	2,982E+00	IIII	1,495E+02
	IIII	1,615E+05	1,148E+07	5,932E+04						

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 1.0
KCYC= 2 TIMDEL= 1.000000E-02 TIMTOT= 1.000000E-02 TTX= 1.011000E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	1.095154E+09	1.669350E+00
2	9.349996E+06	1.620919E-09	-7.687823E+00	9.999989E-01	1.130804E+09	9.164705E-01
3	1.000000E+07	5.166778E-10	9.497146E+00	9.999954E-01	1.260019E+09	3.255118E-01
4	1.062500E+07	1.826004E-10	4.325094E+00	1.000006E+00	1.449085E+09	1.323018E-01
5	1.132499E+07	6.109861E-11	-1.186002E+01	9.999735E-01	1.941975E+09	5.932597E-02
6	1.210004E+07	2.191502E-11	8.817491E+01	9.998918E-01	2.931236E+09	3.211904E-02
7	1.295017E+07	8.862284E-12	3.456021E+02	9.999231E-01	4.096628E+09	1.815274E-02
8	1.405017E+07	3.808691E-12	3.482711E+02	1.000024E+00	5.023641E+09	9.567251E-03
9	1.550010E+07	1.669597E-12	2.005520E+02	1.000039E+00	6.254227E+09	5.221019E-03
10	1.760004E+07	6.827570E-13	8.240084E+01	1.000020E+00	7.737395E+09	2.641380E-03
11	2.070000E+07	2.530498E-13	1.146683E+00	9.999923E-01	1.194122E+10	1.510862E-03
12	2.510013E+07	8.585666E-14	2.527623E+02	9.999712E-01	1.643281E+10	7.054330E-04
13	3.120030E+07	2.619516E-14	5.980813E+02	9.999503E-01	3.206650E+10	4.199936E-04
14	3.970089E+07	6.824084E-15	1.774860E+03	9.999282E-01	5.090911E+10	1.737040E-04

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 1.0
KCYC= 2 TIMDEL= 1.000000E-02 TIMTOT= 2.000000E-02 TTX= 1.012900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	1.098605E+09	1.674610E+00
2	9.349993E+06	1.620898E-09	-1.397213E+01	9.999861E-01	1.150037E+09	9.320466E-01
3	1.000002E+07	5.166815E-10	4.804896E+01	1.000003E+00	1.313818E+09	3.394126E-01
4	1.062499E+07	1.826044E-10	-1.833979E+01	1.000030E+00	1.502073E+09	1.371425E-01
5	1.132499E+07	6.109299E-11	-2.690274E+01	9.998815E-01	2.273348E+09	6.944280E-02
6	1.210018E+07	2.191239E-11	3.499805E+02	9.997721E-01	3.608214E+09	3.953230E-02
7	1.295035E+07	8.862381E-12	7.092040E+02	9.999340E-01	4.725122E+09	2.093792E-02
8	1.405027E+07	3.809056E-12	5.301062E+02	1.000068E+00	5.716390E+09	1.088703E-02
9	1.550018E+07	1.669645E-12	3.688350E+02	1.000068E+00	7.025003E+09	5.860630E-03
10	1.760001E+07	6.827991E-13	2.826860E+01	1.000082E+00	8.724541E+09	2.978554E-03
11	2.069976E+07	2.530406E-13	-4.894941E+02	9.999559E-01	1.920093E+10	2.429307E-03
12	2.510052E+07	8.584750E-14	1.034414E+03	9.998645E-01	3.082868E+10	1.323283E-03
13	3.120102E+07	2.619331E-14	2.189513E+03	9.998797E-01	6.549231E+10	8.577301E-04
14	3.970228E+07	6.823577E-15	4.557740E+03	9.998540E-01	8.605938E+10	2.936164E-04

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 1.0
KCYC= 2 TIMDEL= 1.000000E-02 TIMTOT= 3.000000E-02 TTX= 1.014700E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	1.118914E+09	1.705568E+00
2	9.349996E+06	1.620887E-09	-8.738436E+00	9.999792E-01	1.204416E+09	9.761112E-01
3	1.000003E+07	5.166885E-10	6.154328E+01	1.000016E+00	1.410131E+09	3.642993E-01
4	1.062498E+07	1.825451E-10	-4.688506E+01	9.997791E-01	1.784277E+09	1.629002E-01
5	1.132507E+07	6.107771E-11	1.336333E+02	9.996315E-01	3.199464E+09	9.770798E-02
6	1.210054E+07	2.190912E-11	1.075191E+03	9.996226E-01	4.969232E+09	5.443574E-02
7	1.295066E+07	8.863256E-12	1.319993E+03	1.000033E+00	5.984965E+09	2.652314E-02
8	1.405043E+07	3.809266E-12	8.512203E+02	1.000123E+00	7.482035E+09	1.425053E-02
9	1.550037E+07	1.669764E-12	7.495921E+02	1.000139E+00	9.132334E+09	7.624420E-03
10	1.759966E+07	6.830623E-13	-2.817517E+02	1.000468E+00	1.257305E+10	4.294088E-03
11	2.069772E+07	2.529805E-13	-4.544924E+03	9.997183E-01	5.334331E+10	6.747408E-03
12	2.510330E+07	8.579418E-14	6.600884E+03	9.992434E-01	9.458483E+10	4.057414E-03
13	3.120468E+07	2.619158E-14	9.368428E+03	9.998139E-01	1.548126E+11	2.027394E-03
14	3.970569E+07	6.823655E-15	1.137212E+04	9.998654E-01	1.543941E+11	5.267662E-04

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 1,0
KCYC= 2 TIMDEL= 1,000000E-02 TIMTOT= 4,000000E-02 TTX= 1,016600E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,194926E+09	1,821433E+00
2	9,350016E+06	1,620698E-09	3,238818E+01	9,999861E-01	1,403517E+09	1,137480E+00
3	1,000000E+07	5,167266E-10	8,200326E+00	1,000090E+00	1,647992E+09	4,257807E-01
4	1,062490E+07	1,825123E-10	-1,923489E+02	9,995257E-01	3,028468E+09	2,703664E-01
5	1,132568E+07	6,103377E-11	1,362067E+03	9,989123E-01	6,335371E+09	1,933358E-01
6	1,210150E+07	2,190869E-11	3,004634E+03	9,996033E-01	8,082036E+09	8,853343E-02
7	1,295127E+07	8,867938E-12	2,538441E+03	1,000561E+00	1,028069E+10	4,558426E-02
8	1,405033E+07	3,813036E-12	6,606075E+02	1,001112E+00	1,358069E+10	2,589183E-02
9	1,549834E+07	1,669354E-12	-3,302729E+03	9,998937E-01	3,674364E+10	3,066908E-02
10	1,760170E+07	6,826784E-13	3,382857E+03	9,999054E-01	6,426368E+10	2,193571E-02
11	2,069731E+07	2,527259E-13	-5,309755E+03	9,987125E-01	2,111738E+11	2,670982E-02
12	2,511502E+07	8,566017E-14	2,996351E+04	9,976826E-01	3,531752E+11	1,512652E-02
13	3,121827E+07	2,619448E-14	3,653321E+04	9,999243E-01	4,124307E+11	5,401703E-03
14	3,971410E+07	6,827639E-15	2,820784E+04	1,000449E+00	2,929172E+11	9,999667E-04

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 1,0
KCYC= 2 TIMDEL= 1,000000E-02 TIMTOT= 5,000000E-02 TTX= 1,018400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,556786E+09	2,373018E+00
2	9,350064E+06	1,621013E-09	1,279931E+02	1,000057E+00	2,066129E+09	1,674611E+00
3	9,999871E+06	5,168082E-10	-2,581384E+02	1,000248E+00	3,090589E+09	7,986208E-01
4	1,062475E+07	1,820776E-10	-4,859472E+02	9,971448E-01	1,013203E+10	9,224081E-01
5	1,132891E+07	6,090804E-11	7,782142E+03	9,968545E-01	1,752733E+10	5,337775E-01
6	1,210418E+07	2,196558E-11	8,348175E+03	1,002199E+00	2,337416E+10	2,567135E-01
7	1,295014E+07	8,921558E-12	2,531560E+02	1,006611E+00	3,916318E+10	1,746983E-01
8	1,404093E+07	3,787453E-12	-1,751908E+04	9,943958E-01	1,323604E+11	2,506544E-01
9	1,552008E+07	1,652687E-12	3,952338E+04	9,899109E-01	2,126574E+11	1,757281E-01
10	1,762079E+07	6,832705E-13	4,155660E+04	1,000773E+00	2,403019E+11	8,209560E-02
11	2,071457E+07	2,533153E-13	2,918316E+04	1,001042E+00	3,111053E+11	3,940387E-02
12	2,511386E+07	8,577405E-14	2,774580E+04	9,990090E-01	4,301048E+11	1,844592E-02
13	3,122645E+07	2,616712E-14	5,284825E+04	9,988802E-01	7,639804E+11	9,995585E-03
14	3,972663E+07	6,823693E-15	5,326588E+04	9,999002E-01	5,491716E+11	1,873744E-03

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 1,0
KCYC= 4 TIMDEL= 1,600000E-02 TIMTOT= 6,600000E-02 TTX= 1,020900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	2,448636E+09	3,732470E+00
2	9,350156E+06	1,622797E-09	3,095097E+02	1,001158E+00	3,009883E+09	2,442214E+00
3	9,998366E+06	5,174649E-10	-3,264196E+03	1,001519E+00	8,582768E+09	2,220640E+00
4	1,062320E+07	1,806311E-10	-3,381588E+03	9,892233E-01	3,926471E+10	3,546215E+00
5	1,133882E+07	6,050131E-11	2,723528E+04	9,901978E-01	6,854321E+10	2,073477E+00
6	1,211204E+07	2,177305E-11	2,441305E+04	9,934143E-01	1,269266E+11	1,381790E+00
7	1,297534E+07	8,712036E-12	5,056511E+04	9,829708E-01	2,396726E+11	1,044018E+00
8	1,409586E+07	3,789796E-12	9,080968E+04	9,950110E-01	2,662483E+11	5,045133E-01
9	1,553347E+07	1,680300E-12	6,714824E+04	1,006450E+00	2,671428E+11	2,244400E-01
10	1,762408E+07	6,848544E-13	4,824683E+04	1,003093E+00	2,656228E+11	9,095640E-02
11	2,071838E+07	2,535318E-13	3,678314E+04	1,001697E+00	2,636310E+11	3,341942E-02
12	2,510932E+07	8,590443E-14	1,866826E+04	1,000528E+00	2,604717E+11	1,118784E-02
13	3,121514E+07	2,616021E-14	3,027435E+04	9,986163E-01	7,888552E+11	1,031831E-02
14	3,972982E+07	6,812203E-15	5,961785E+04	9,981872E-01	7,068701E+11	2,407671E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,58E+02	4,58E+02	3,74E+06	3,82E+09	1,67E+09	2,22E+11	5,01E+13	1,34E+13	1,04E+09	1,00E+00	1,00E+00	1,68E+00	189,7	189,7
2	4,81E+02	4,81E+02	3,94E+06	2,87E+09	1,35E+09	3,18E+11	2,66E+13	7,04E+12	8,41E+08	1,00E+00	1,00E+00	9,22E-01	195,3	195,3
3	5,72E+02	5,72E+02	4,69E+06	2,76E+09	1,25E+09	4,30E+11	8,48E+12	2,08E+12	8,67E+08	1,00E+00	1,91E+00	3,31E-01	214,3	214,2
4	6,07E+02	6,07E+02	5,29E+06	1,37E+09	6,87E+08	3,25E+11	3,00E+12	6,49E+11	5,02E+08	1,00E+00	1,68E+01	1,36E-01	241,0	241,0
5	6,40E+02	6,40E+02	7,77E+06	6,18E+08	3,71E+08	1,52E+11	1,00E+12	1,96E+11	2,05E+08	1,00E+00	5,05E+05	6,08E-02	317,8	317,8
6	7,42E+02	7,42E+02	2,15E+07	4,62E+08	3,19E+08	6,11E+10	3,59E+11	6,69E+10	1,02E+08	1,00E+00	1,46E+07	3,30E-02	476,1	476,1
7	7,97E+02	7,97E+02	3,17E+07	2,62E+08	1,99E+08	3,21E+10	1,44E+11	2,43E+10	4,70E+07	1,00E+00	2,84E+07	1,85E-02	653,4	653,4
8	6,91E+02	6,91E+02	1,33E+07	6,88E+07	5,04E+07	1,75E+10	6,11E+10	9,41E+09	2,33E+07	8,15E+03	1,09E+07	9,64E-03	786,0	786,0
9	7,65E+02	7,65E+02	1,32E+07	4,53E+07	3,19E+07	9,76E+09	2,61E+10	3,65E+09	1,69E+07	2,47E+05	1,04E+07	5,27E-03	954,4	954,5
10	9,11E+02	9,11E+02	1,56E+07	2,84E+07	1,79E+07	5,21E+09	1,02E+10	1,28E+09	1,15E+07	3,06E+06	9,30E+06	2,66E-03	1140,5	1140,5
11	1,74E+03	1,74E+03	5,03E+07	5,01E+07	2,88E+07	2,62E+09	3,45E+09	3,71E+08	6,64E+06	2,89E+07	1,75E+07	1,59E-03	1649,9	1649,9
12	2,36E+03	2,36E+03	3,86E+07	2,74E+07	1,08E+07	1,22E+09	9,99E+08	9,22E+07	3,19E+06	2,41E+07	1,20E+07	7,25E-04	2092,0	2092,0
13	4,52E+03	4,52E+03	3,74E+07	1,71E+07	4,89E+06	5,00E+08	2,20E+08	1,67E+07	1,11E+06	2,04E+07	1,32E+07	4,26E-04	3542,1	3542,0
14	6,67E+03	6,67E+03	1,72E+07	4,41E+06	6,26E+05	1,71E+08	3,29E+07	1,96E+06	2,57E+05	6,19E+06	8,67E+06	1,74E-04	4922,9	4922,7

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,77E+02	4,77E+02	3,88E+06	5,14E+09	2,02E+09	2,23E+11	5,01E+13	1,34E+13	1,33E+09	1,00E+00	1,00E+00	1,68E+00	190,3	190,3
2	5,49E+02	5,49E+02	4,42E+06	6,79E+09	2,32E+09	3,21E+11	2,66E+13	7,04E+12	1,70E+09	1,00E+00	1,00E+00	9,43E-01	198,5	198,5
3	6,62E+02	6,62E+02	5,38E+06	6,12E+09	2,07E+09	4,33E+11	8,48E+12	2,08E+12	1,66E+09	1,00E+00	1,93E+00	3,51E-01	223,2	223,2
4	6,32E+02	6,32E+02	5,55E+06	1,71E+09	8,24E+08	3,26E+11	3,00E+12	6,48E+11	6,05E+08	1,00E+00	1,80E+01	1,41E-01	249,7	249,7
5	7,48E+02	7,48E+02	1,12E+07	1,34E+09	7,07E+08	1,55E+11	1,00E+12	1,94E+11	3,92E+08	1,00E+00	1,43E+06	7,24E-02	371,2	371,2
6	8,94E+02	8,94E+02	4,16E+07	1,03E+09	6,08E+08	6,34E+10	3,59E+11	6,57E+10	1,97E+08	1,00E+00	3,29E+07	4,13E-02	583,9	583,8
7	8,47E+02	8,47E+02	4,04E+07	3,63E+08	2,57E+08	3,31E+10	1,44E+11	2,38E+10	5,83E+07	4,08E+00	3,69E+07	2,14E-02	751,6	751,5
8	8,14E+02	8,14E+02	2,54E+07	1,32E+08	1,02E+08	1,80E+10	6,10E+10	9,19E+09	2,62E+07	2,52E+04	2,28E+07	1,11E-02	891,5	891,6
9	9,39E+02	9,39E+02	2,78E+07	8,15E+07	6,42E+07	9,95E+09	2,61E+10	3,56E+09	1,74E+07	1,57E+06	2,15E+07	6,01E-03	1068,1	1068,2
10	1,15E+03	1,15E+03	2,99E+07	5,75E+07	4,24E+07	5,27E+09	1,02E+10	1,24E+09	1,15E+07	6,11E+06	1,98E+07	3,07E-03	1279,9	1280,0
11	2,89E+03	2,89E+03	1,47E+08	1,33E+08	7,07E+07	2,68E+09	3,34E+09	3,33E+08	6,33E+06	1,01E+08	3,78E+07	2,65E-03	2552,6	2552,5
12	4,16E+03	4,16E+03	1,08E+08	7,39E+07	2,96E+07	1,23E+09	9,39E+08	8,12E+07	2,98E+06	7,69E+07	2,85E+07	1,38E-03	3693,2	3693,0
13	7,09E+03	7,09E+03	8,49E+07	3,64E+07	1,36E+07	4,93E+08	1,91E+08	1,38E+07	9,74E+05	4,85E+07	3,08E+07	8,75E-04	6673,4	6673,0
14	8,55E+03	8,55E+03	2,95E+07	7,16E+06	1,39E+06	1,64E+08	2,83E+07	1,64E+06	2,36E+05	1,07E+07	1,52E+07	2,95E-04	7965,2	7964,6

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,55E+02	5,55E+02	4,41E+06	1,37E+10	3,10E+09	2,28E+11	5,00E+13	1,34E+13	2,90E+09	1,00E+00	1,00E+00	1,73E+00	193,7	193,7
2	6,63E+02	6,63E+02	5,17E+06	1,94E+10	3,18E+09	3,29E+11	2,66E+13	7,03E+12	3,82E+09	1,00E+00	1,00E+00	1,01E+00	207,7	207,7
3	7,67E+02	7,67E+02	6,09E+06	1,24E+10	2,77E+09	4,37E+11	8,48E+12	2,08E+12	2,91E+09	1,00E+00	1,98E+00	3,86E-01	239,2	239,2
4	7,63E+02	7,63E+02	6,90E+06	4,32E+09	1,59E+09	3,34E+11	2,99E+12	6,43E+11	1,32E+09	1,00E+00	3,51E+01	1,72E-01	295,9	295,9
5	9,48E+02	9,48E+02	2,00E+07	3,55E+09	1,37E+09	1,64E+11	1,00E+12	1,89E+11	9,29E+08	1,00E+00	5,35E+06	1,05E-01	519,7	519,6
6	1,06E+03	1,06E+03	7,18E+07	1,97E+09	9,19E+08	6,83E+10	3,58E+11	6,32E+10	3,75E+08	1,00E+00	6,17E+07	5,77E-02	799,2	799,0
7	9,12E+02	9,12E+02	5,39E+07	5,06E+08	3,34E+08	3,52E+10	1,44E+11	2,28E+10	7,62E+07	2,09E+01	4,97E+07	2,73E-02	946,8	946,8
8	1,10E+03	1,10E+03	6,98E+07	3,26E+08	2,44E+08	1,90E+10	6,08E+10	8,65E+09	3,33E+07	3,06E+05	5,87E+07	1,49E-02	1157,2	1157,3
9	1,36E+03	1,36E+03	8,02E+07	2,29E+08	1,75E+08	1,04E+10	2,59E+10	3,32E+09	1,84E+07	7,51E+06	5,65E+07	8,14E-03	1373,8	1373,9
10	1,96E+03	1,96E+03	1,29E+08	1,78E+08	1,30E+08	5,50E+09	1,00E+10	1,11E+09	1,12E+07	5,23E+07	5,76E+07	4,75E-03	1802,6	1803,0
11	6,35E+03	6,35E+03	5,55E+08	4,91E+08	1,81E+08	2,86E+09	2,93E+09	2,19E+08	7,49E+06	4,37E+08	1,08E+08	7,44E-03	6325,7	6324,8
12	9,12E+03	9,12E+03	3,67E+08	2,30E+08	9,25E+07	1,22E+09	7,30E+08	5,16E+07	6,78E+06	2,67E+08	9,65E+07	4,23E-03	9864,5	9860,7
13	1,19E+04	1,19E+04	1,89E+08	7,16E+07	3,09E+07	4,60E+08	1,34E+08	8,83E+06	1,74E+06	1,10E+08	7,31E+07	2,06E-03	14312,5	14311,2
14	1,11E+04	1,11E+04	5,05E+07	1,10E+07	2,78E+06	1,52E+08	2,12E+07	1,17E+06	2,26E+05	1,85E+07	2,71E+07	5,30E-04	13621,4	13620,5

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,06E+02	7,06E+02	5,37E+06	4,89E+10	2,23E+09	2,50E+11	5,00E+13	1,34E+13	7,20E+09	1,00E+00	1,00E+00	1,89E+00	206,6	206,6
2	8,83E+02	8,83E+02	6,57E+06	6,75E+10	1,34E+09	3,60E+11	2,66E+13	7,02E+12	8,88E+09	1,00E+00	1,00E+00	1,24E+00	241,1	241,1
3	9,19E+02	9,19E+02	7,12E+06	2,59E+10	2,81E+09	4,52E+11	8,47E+12	2,07E+12	5,03E+09	1,00E+00	2,09E+00	4,69E-01	278,6	278,6
4	1,06E+03	1,06E+03	1,01E+07	1,54E+10	2,58E+09	3,71E+11	2,99E+12	6,23E+11	3,69E+09	1,00E+00	6,39E+02	3,06E-01	498,4	498,3
5	1,41E+03	1,41E+03	4,66E+07	1,19E+10	2,00E+09	1,95E+11	9,94E+11	1,72E+11	3,35E+09	1,00E+00	2,19E+07	2,18E-01	1014,8	1014,2
6	1,14E+03	1,14E+03	1,02E+08	2,68E+09	1,04E+09	8,09E+10	3,57E+11	5,67E+10	6,80E+08	1,00E+00	9,18E+07	9,34E-02	1284,7	1284,4
7	1,39E+03	1,39E+03	1,66E+08	1,69E+09	8,20E+08	4,10E+10	1,43E+11	1,98E+10	2,18E+08	8,57E+02	1,53E+08	4,86E-02	1597,7	1598,2
8	2,08E+03	2,08E+03	2,59E+08	1,51E+09	7,37E+08	2,21E+10	5,99E+10	7,10E+09	5,60E+07	3,94E+06	1,95E+08	2,94E-02	2042,7	2043,8
9	5,96E+03	5,96E+03	1,20E+09	3,35E+09	7,06E+08	1,47E+10	2,33E+10	1,27E+09	5,79E+07	8,28E+08	2,96E+08	4,02E-02	4883,4	4883,2
10	8,04E+03	8,04E+03	1,55E+09	2,12E+09	5,37E+08	6,73E+09	8,14E+09	4,12E+08	7,60E+07	1,26E+09	2,73E+08	2,52E-02	7703,2	7702,8
11	1,63E+04	1,63E+04	2,88E+09	1,73E+09	6,02E+08	2,73E+09	1,14E+09	1,56E+07	4,21E+07	2,31E+09	5,55E+08	2,80E-02	17848,1	17836,6
12	2,30E+04	2,30E+04	1,34E+09	4,58E+08	2,02E+08	1,00E+09	2,17E+08	6,01E+06	1,10E+07	9,49E+08	3,90E+08	1,54E-02	29625,6	29591,3
13	2,30E+04	2,30E+04	4,10E+08	1,02E+08	5,07E+07	3,75E+08	4,90E+07	2,60E+06	1,69E+06	2,33E+08	1,74E+08	5,46E-03	35201,1	35199,8
14	1,51E+04	1,51E+04	8,57E+07	1,45E+07	4,77E+06	1,31E+08	1,17E+07	5,99E+05	1,89E+05	3,15E+07	4,89E+07	1,00E-03	24793,1	24798,6

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,01E+03	1,01E+03	7,37E+06	1,99E+11	1,74E+07	3,65E+11	5,00E+13	1,34E+13	1,32E+10	1,00E+00	1,00E+00	2,72E+00	267,3	267,3
2	1,26E+03	1,26E+03	8,97E+06	2,07E+11	1,02E+07	4,75E+11	2,65E+13	6,96E+12	1,36E+10	1,00E+00	1,00E+00	2,05E+00	351,2	351,2
3	1,29E+03	1,29E+03	9,65E+06	7,45E+10	8,38E+08	5,70E+11	8,44E+12	2,01E+12	1,08E+10	1,00E+00	2,80E+00	9,32E-01	517,3	517,4
4	1,95E+03	1,95E+03	3,27E+07	3,76E+10	4,04E+08	6,12E+11	2,95E+12	4,85E+11	3,55E+10	1,00E+00	8,16E+03	1,13E+00	1622,6	1620,3
5	2,07E+03	2,07E+03	8,78E+07	1,76E+10	1,07E+09	3,12E+11	9,82E+11	1,06E+11	1,77E+10	1,00E+00	4,70E+07	6,23E-01	2714,3	2710,0
6	2,42E+03	2,42E+03	3,11E+08	1,17E+10	1,35E+09	1,29E+11	3,51E+11	3,09E+10	5,12E+09	2,39E+00	2,80E+08	2,86E-01	3544,5	3548,4
7	5,96E+03	5,96E+03	6,63E+08	2,04E+10	1,51E+09	7,36E+10	1,32E+11	3,89E+09	1,21E+09	1,60E+08	3,46E+08	2,23E-01	5517,6	5535,8
8	1,24E+04	1,24E+04	2,66E+10	4,44E+10	1,51E+10	2,86E+10	1,70E+10	1,00E+00	3,33E+08	2,13E+10	3,32E+08	2,81E-01	11773,7	11740,7
9	1,18E+04	1,18E+04	4,31E+10	9,64E+09	3,98E+09	9,21E+09	9,65E+08	1,00E+00	1,88E+06	3,54E+10	7,00E+09	1,83E-01	9479,2	9431,2
10	1,27E+04	1,27E+04	1,99E+10	3,13E+09	1,28E+09	3,72E+09	1,84E+08	1,00E+00	4,07E+05	1,54E+10	4,31E+09	8,52E-02	10887,9	10892,1
11	1,53E+04	1,53E+04	8,65E+09	6,01E+08	2,51E+08	8,99E+08	3,10E+06	1,00E+00	1,07E+04	6,16E+09	2,49E+09	3,98E-02	15656,2	15664,3
12	2,15E+04	2,15E+04	2,84E+09	1,85E+08	8,86E+07	3,64E+08	1,32E+06	1,00E+00	2,32E+04	1,79E+09	1,06E+09	1,86E-02	27178,8	27165,3
13	2,30E+04	2,30E+04	7,32E+08	6,16E+07	3,71E+07	2,07E+08	3,05E+06	1,10E+05	1,03E+05	3,82E+08	3,50E+08	1,00E-02	61093,5	61059,3
14	2,19E+04	2,19E+04	1,29E+08	1,49E+07	6,18E+06	1,03E+08	3,92E+06	1,75E+05	9,08E+04	4,63E+07	7,88E+07	1,88E-03	46100,0	46097,7

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 0,00 TDAT2 = 1,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,33E+03	1,33E+03	9,51E+06	4,06E+11	4,16E+03	7,64E+11	4,98E+13	1,31E+13	2,12E+10	1,00E+00	1,00E+00	5,02E+00	416,4	416,4
2	1,59E+03	1,59E+03	1,11E+07	3,49E+11	8,72E+04	6,87E+11	2,65E+13	6,86E+12	1,73E+10	1,00E+00	1,00E+00	3,22E+00	506,3	506,6
3	2,02E+03	2,02E+03	4,84E+07	9,22E+10	1,45E+06	1,18E+12	8,42E+12	1,66E+12	9,98E+10	1,00E+00	4,76E+00	2,88E+00	1404,1	1405,1
4	3,43E+03	3,43E+03	8,82E+08	1,25E+11	1,67E+08	1,83E+12	2,83E+12	1,00E+00	1,36E+11	2,23E+00	2,28E+01	5,89E+00	5694,6	5663,9
5	4,95E+03	4,95E+03	1,29E+09	4,35E+11	6,16E+08	9,00E+11	7,66E+11	1,00E+00	3,48E+10	4,96E+08	8,90E+06	3,45E+00	8924,6	8880,8
6	1,19E+04	1,19E+04	6,59E+10	4,88E+11	1,63E+11	1,54E+11	1,00E+00	1,00E+00	2,71E+09	2,98E+10	5,38E+07	1,60E+00	12006,3	11966,7
7	1,13E+04	1,13E+04	2,69E+11	3,81E+10	1,35E+10	2,90E+10	1,00E+00	1,00E+00	1,08E+04	2,36E+11	5,02E+10	1,07E+00	9504,8	9423,6
8	1,15E+04	1,15E+04	1,52E+11	3,60E+09	9,96E+08	1,62E+09	1,00E+00	1,00E+00	1,00E+09	1,17E+11	3,46E+10	5,05E-01	11606,0	11577,0
9	1,16E+04	1,16E+04	6,86E+10	6,57E+08	1,82E+08	3,57E+08	1,00E+00	1,00E+00	1,00E+00	5,18E+10	1,68E+10	2,24E-01	11606,0	11643,4
10	1,16E+04	1,16E+04	2,82E+10	9,82E+07	2,72E+07	5,44E+07	1,00E+00	1,00E+00	1,00E+00	2,04E+10	7,76E+09	9,10E-02	11606,0	11623,9
11	1,16E+04	1,16E+04	1,04E+10	1,13E+07	3,13E+06	1,01E+07	1,00E+00	1,00E+00	1,00E+00	7,01E+09	3,38E+09	3,34E-02	11606,0	11617,0
12	1,16E+04	1,16E+04	3,49E+09	9,99E+05	2,40E+05	1,17E+06	1,00E+00	1,00E+00	1,00E+00	2,07E+09	1,42E+09	1,12E-02	11606,0	11609,1
13	2,30E+04	2,30E+04	9,41E+08	2,05E+07	1,43E+07	6,89E+07	2,39E+04	6,36E+02	2,86E+03	4,52E+08	4,88E+08	1,03E-02	60272,5	60230,8
14	2,30E+04	2,30E+04	1,53E+08	1,29E+07	6,04E+06	8,67E+07	1,84E+06	7,46E+04	4,72E+04	5,35E+07	9,56E+07	2,41E-03	59323,5	59269,7

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 3,0
KCYC= 6 TIMDEL= 1,400000E-02 TIMTOT= 8,000000E-02 TTX= 1,046000E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,099443E+09	1,675888E+00
2	9,349966E+06	1,620891E-09	-2,272072E+01	9,999624E-01	1,137144E+09	9,215932E-01
3	1,000005E+07	5,166431E-10	3,890463E+01	9,999329E-01	1,281533E+09	3,310477E-01
4	1,062506E+07	1,826069E-10	5,182739E+01	1,000036E+00	1,484574E+09	1,355467E-01
5	1,132499E+07	6,108492E-11	9,800695E+00	9,997760E-01	1,988411E+09	6,073098E-02
6	1,210045E+07	2,189546E-11	3,220450E+02	9,991077E-01	3,006867E+09	3,291837E-02
7	1,295165E+07	8,856798E-12	1,126689E+03	9,993809E-01	4,177782E+09	1,850089E-02
8	1,405163E+07	3,809766E-12	1,102328E+03	1,000230E+00	5,063784E+09	9,645914E-03
9	1,550090E+07	1,670162E-12	6,029773E+02	1,000338E+00	6,308702E+09	5,268277E-03
10	1,760035E+07	6,828697E-13	2,278762E+02	1,000165E+00	7,854018E+09	2,681635E-03
11	2,070001E+07	2,530283E-13	7,941144E+00	9,999150E-01	1,252847E+10	1,585029E-03
12	2,510131E+07	8,583567E-14	9,318571E+02	9,997555E-01	1,688978E+10	7,248727E-04
13	3,120279E+07	2,618493E-14	1,896253E+03	9,996094E-01	3,254683E+10	4,261182E-04
14	3,970807E+07	6,820175E-15	5,410301E+03	9,994272E-01	5,109888E+10	1,742516E-04

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 3,0
KCYC= 6 TIMDEL= 1,400000E-02 TIMTOT= 9,400000E-02 TTX= 1,048300E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,104228E+09	1,683182E+00
2	9,349931E+06	1,620663E-09	-4,757156E+01	9,998548E-01	1,163901E+09	9,431455E-01
3	1,000027E+07	5,166685E-10	1,936877E+02	9,999749E-01	1,360004E+09	3,513357E-01
4	1,062497E+07	1,826486E-10	-8,018186E-01	1,000242E+00	1,546118E+09	1,411982E-01
5	1,132492E+07	6,103111E-11	-3,727608E+01	9,989872E-01	2,370475E+09	7,233636E-02
6	1,210173E+07	2,187059E-11	1,207627E+03	9,980923E-01	3,768962E+09	4,121471E-02
7	1,295337E+07	8,858142E-12	2,303951E+03	9,995218E-01	4,837592E+09	2,142604E-02
8	1,405243E+07	3,811393E-12	1,637589E+03	1,000613E+00	5,805683E+09	1,106387E-02
9	1,550168E+07	1,670579E-12	1,121988E+03	1,000560E+00	7,197546E+09	6,012036E-03
10	1,760012E+07	6,832705E-13	7,296807E+01	1,000690E+00	8,982956E+09	3,068894E-03
11	2,069763E+07	2,529367E-13	-1,632741E+03	9,995894E-01	2,093963E+10	2,648200E-03
12	2,510524E+07	8,574894E-14	3,682313E+03	9,988519E-01	3,215170E+10	1,378487E-03
13	3,121017E+07	2,616886E-14	6,884077E+03	9,990665E-01	6,678307E+10	8,739183E-04
14	3,972071E+07	6,815703E-15	1,387142E+04	9,988460E-01	8,644765E+10	2,946008E-04

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 3,0
KCYC= 6 TIMDEL= 1,400000E-02 TIMTOT= 1,080000E-01 TTX= 1,050600E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,132594E+09	1,726420E+00
2	9,349958E+06	1,620506E-09	-2,832916E+01	9,997651E-01	1,240575E+09	1,005180E+00
3	1,000037E+07	5,167176E-10	2,755787E+02	1,000056E+00	1,495232E+09	3,863064E-01
4	1,062488E+07	1,825582E-10	-4,582732E+01	9,997977E-01	1,888231E+09	1,723560E-01
5	1,132574E+07	6,088608E-11	5,447416E+02	9,968624E-01	3,437469E+09	1,046470E-01
6	1,210525E+07	2,184182E-11	3,620793E+03	9,969285E-01	5,260933E+09	5,745418E-02
7	1,295617E+07	8,867479E-12	4,181045E+03	1,000476E+00	6,152524E+09	2,727869E-02
8	1,405382E+07	3,813286E-12	2,545292E+03	1,001055E+00	7,849804E+09	1,496678E-02
9	1,550347E+07	1,671620E-12	2,341313E+03	1,001112E+00	9,754243E+09	8,152693E-03
10	1,759869E+07	6,856581E-13	-8,959991E+02	1,003800E+00	1,393622E+10	4,777742E-03
11	2,067943E+07	2,523802E-13	-1,366266E+04	9,976274E-01	5,673052E+10	7,411211E-03
12	2,513137E+07	8,526754E-14	2,138115E+04	9,938617E-01	9,825529E+10	4,188994E-03
13	3,124294E+07	2,615510E-14	2,887177E+04	9,986071E-01	1,574434E+11	2,058974E-03
14	3,975152E+07	6,816655E-15	3,445208E+04	9,989741E-01	1,551554E+11	5,288205E-04

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 3,0
KCYC= 6 TIMDEL= 1,400000E-02 TIMTOT= 1,220000E-01 TTX= 1,052900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,241294E+09	1,892112E+00
2	9,350177E+06	1,620430E-09	1,275297E+02	9,997113E-01	1,529996E+09	1,239626E+00
3	1,000024E+07	5,170641E-10	2,283225E+02	1,000653E+00	1,817034E+09	4,697615E-01
4	1,062425E+07	1,817565E-10	-4,453549E+02	9,958586E-01	3,351711E+09	3,045976E-01
5	1,133190E+07	6,047530E-11	4,842568E+03	9,908499E-01	7,101888E+09	2,147444E-01
6	1,211436E+07	2,184980E-11	9,813509E+03	9,973117E-01	8,515840E+09	9,303466E-02
7	1,296143E+07	8,915983E-12	7,616775E+03	1,005416E+00	1,098062E+10	4,895149E-02
8	1,405208E+07	3,852609E-12	1,070433E+03	1,010378E+00	1,548674E+10	2,983217E-02
9	1,548143E+07	1,665716E-12	-1,335723E+04	9,978219E-01	4,809523E+10	4,005654E-02
10	1,762228E+07	6,608328E-13	1,692473E+04	9,972965E-01	7,383188E+10	2,513358E-02
11	2,068049E+07	2,504962E-13	-1,073753E+04	9,911773E-01	2,203383E+11	2,759696E-02
12	2,523472E+07	8,414622E-14	8,887933E+04	9,823261E-01	3,565117E+11	1,499955E-02
13	3,136528E+07	2,617667E-14	1,103346E+05	9,993202E-01	4,165180E+11	5,451528E-03
14	3,982748E+07	6,852472E-15	8,523141E+04	1,003637E+00	2,948650E+11	1,010277E-03

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 3,0
KCYC= 6 TIMDEL= 1,500000E-02 TIMTOT= 1,370000E-01 TTX= 1,055200E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,781976E+09	2,716277E+00
2	9,350805E+06	1,621055E-09	6,067955E+02	1,000026E+00	2,524317E+09	2,046028E+00
3	9,999206E+06	5,177633E-10	-4,047465E+02	1,001848E+00	3,610467E+09	9,346837E-01
4	1,062313E+07	1,777229E-10	-8,337137E+02	9,760834E-01	1,221598E+10	1,085529E+00
5	1,136366E+07	5,945415E-11	2,660863E+04	9,761294E-01	2,022318E+10	6,011761E-01
6	1,213771E+07	2,246612E-11	2,489268E+04	1,022786E+00	2,637898E+10	2,963166E-01
7	1,294806E+07	9,297501E-12	-2,245653E+03	1,042139E+00	5,095702E+10	2,368865E-01
8	1,399658E+07	3,638151E-12	-2,138679E+04	9,605798E-01	1,456387E+11	2,649277E-01
9	1,567632E+07	1,548810E-12	1,110233E+05	9,371462E-01	2,141206E+11	1,658160E-01
10	1,778659E+07	6,864027E-13	1,238741E+05	1,004584E+00	2,499686E+11	8,578957E-02
11	2,083550E+07	2,553501E-13	9,216859E+04	1,008033E+00	3,157951E+11	4,031916E-02
12	2,522562E+07	8,514950E-14	8,433826E+04	9,927187E-01	4,317037E+11	1,837968E-02
13	3,143748E+07	2,593805E-14	1,574721E+05	9,912457E-01	7,638642E+11	9,906575E-03
14	3,994000E+07	6,817717E-15	1,600857E+05	9,990950E-01	5,507718E+11	1,877503E-03

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 3,0
KCYC= 12 TIMDEL= 2,600000E-02 TIMTOT= 1,630000E-01 TTX= 1,058600E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	3,290927E+09	5,016380E+00
2	9,352259E+06	1,641832E-09	1,714864E+03	1,011730E+00	3,988197E+09	3,273975E+00
3	9,981930E+06	5,285934E-10	-1,313713E+04	1,021506E+00	1,126288E+10	2,976742E+00
4	1,059846E+07	1,635542E-10	-1,398106E+04	9,054595E-01	6,208857E+10	5,077422E+00
5	1,149600E+07	5,396718E-11	1,177082E+05	8,920002E-01	1,077481E+11	2,907430E+00
6	1,227767E+07	2,104920E-11	1,423772E+05	9,667551E-01	1,441061E+11	1,516659E+00
7	1,319218E+07	8,024235E-12	1,671658E+05	9,210516E-01	2,360663E+11	9,471258E-01
8	1,443616E+07	3,693400E-12	2,401665E+05	9,745643E-01	2,628404E+11	4,853873E-01
9	1,580478E+07	1,752485E-12	2,062018E+05	1,042959E+00	2,728206E+11	2,390569E-01
10	1,782032E+07	7,026475E-13	1,492860E+05	1,025981E+00	2,690513E+11	9,452410E-02
11	2,086606E+07	2,575567E-13	1,111802E+05	1,015876E+00	2,657156E+11	3,421842E-02
12	2,518479E+07	8,628370E-14	5,720143E+04	1,004415E+00	2,610464E+11	1,126202E-02
13	3,133632E+07	2,567690E-14	9,094946E+04	9,891701E-01	7,858727E+11	1,016797E-02
14	3,996775E+07	6,715343E-15	1,778995E+05	9,857815E-01	7,036403E+11	2,362593E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,56E+02	4,56E+02	1,26E+06	3,48E+09	1,00E+00	2,24E+11	5,01E+13	1,34E+13	2,36E+09	1,00E+00	1,00E+00	1,68E+00	190,5	190,5
2	4,80E+02	4,80E+02	1,33E+06	2,66E+09	1,00E+00	3,20E+11	2,66E+13	7,04E+12	1,97E+09	1,00E+00	1,00E+00	9,26E-01	196,4	196,4
3	5,71E+02	5,71E+02	1,58E+06	2,55E+09	1,00E+00	4,31E+11	8,48E+12	2,08E+12	1,90E+09	1,00E+00	1,93E+00	3,35E-01	218,0	218,0
4	6,06E+02	6,06E+02	1,71E+06	1,31E+09	1,00E+00	3,26E+11	3,00E+12	6,48E+11	1,12E+09	1,00E+00	1,57E+01	1,38E-01	247,0	247,0
5	6,40E+02	6,40E+02	2,00E+06	6,07E+08	2,09E+07	1,52E+11	1,00E+12	1,95E+11	5,34E+08	1,00E+00	1,03E+02	6,18E-02	325,6	325,6
6	7,42E+02	7,42E+02	4,17E+06	4,63E+08	9,72E+07	6,13E+10	3,59E+11	6,66E+10	3,13E+08	1,00E+00	7,05E+05	3,37E-02	488,9	488,7
7	7,98E+02	7,98E+02	1,29E+07	2,71E+08	1,21E+08	3,22E+10	1,44E+11	2,42E+10	1,24E+08	1,00E+00	1,01E+07	1,86E-02	666,8	666,6
8	6,92E+02	6,92E+02	8,43E+06	7,12E+07	4,23E+07	1,76E+10	6,11E+10	9,40E+09	3,30E+07	1,00E+00	7,40E+06	9,69E-03	792,1	792,2
9	7,67E+02	7,67E+02	9,56E+06	4,68E+07	3,08E+07	9,77E+09	2,61E+10	3,65E+09	1,97E+07	2,94E+03	8,99E+06	5,29E-03	962,4	962,6
10	9,14E+02	9,14E+02	1,07E+07	2,99E+07	1,98E+07	5,22E+09	1,02E+10	1,28E+09	1,21E+07	6,41E+05	8,80E+06	2,70E-03	1157,3	1157,4
11	1,75E+03	1,75E+03	3,97E+07	5,42E+07	3,21E+07	2,64E+09	3,45E+09	3,60E+08	6,84E+06	1,83E+07	1,70E+07	1,65E-03	1732,2	1732,1
12	2,36E+03	2,36E+03	3,45E+07	2,91E+07	1,26E+07	1,23E+09	9,99E+08	8,96E+07	3,13E+06	2,15E+07	1,19E+07	7,42E-04	2153,3	2153,1
13	4,39E+03	4,39E+03	3,39E+07	1,84E+07	7,13E+06	5,10E+08	2,20E+08	1,63E+07	1,09E+06	2,00E+07	1,31E+07	4,31E-04	3613,5	3612,8
14	6,36E+03	6,36E+03	1,61E+07	4,71E+06	1,40E+06	1,72E+08	3,29E+07	1,94E+06	2,55E+05	6,16E+06	8,65E+06	1,75E-04	4965,8	4964,4

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,75E+02	4,75E+02	1,32E+06	4,58E+09	1,00E+00	2,26E+11	5,01E+13	1,34E+13	2,78E+09	1,00E+00	1,00E+00	1,69E+00	191,3	191,3
2	5,47E+02	5,47E+02	1,51E+06	5,92E+09	1,00E+00	3,24E+11	2,66E+13	7,04E+12	3,14E+09	1,00E+00	1,00E+00	9,52E-01	201,0	201,0
3	6,61E+02	6,61E+02	1,82E+06	5,38E+09	1,00E+00	4,35E+11	8,48E+12	2,08E+12	2,95E+09	1,00E+00	2,00E+00	3,60E-01	231,3	231,3
4	6,32E+02	6,32E+02	1,79E+06	1,62E+09	1,00E+00	3,27E+11	3,00E+12	6,47E+11	1,32E+09	1,00E+00	1,61E+01	1,44E-01	257,2	257,2
5	7,48E+02	7,48E+02	2,47E+06	1,29E+09	2,54E+07	1,55E+11	1,00E+12	1,93E+11	9,87E+08	1,00E+00	2,07E+02	7,46E-02	387,7	387,5
6	8,95E+02	8,95E+02	6,68E+06	1,02E+09	1,57E+08	6,38E+10	3,58E+11	6,51E+10	6,01E+08	1,00E+00	1,83E+06	4,28E-02	611,1	610,5
7	8,49E+02	8,49E+02	1,66E+07	3,74E+08	1,51E+08	3,33E+10	1,44E+11	2,37E+10	1,62E+08	1,00E+00	1,36E+07	2,19E-02	769,8	769,6
8	8,17E+02	8,17E+02	1,69E+07	1,37E+08	8,27E+07	1,80E+10	6,10E+10	9,17E+09	4,66E+07	1,82E+00	1,57E+07	1,12E-02	905,1	905,4
9	9,44E+02	9,44E+02	1,93E+07	8,56E+07	6,15E+07	9,97E+09	2,61E+10	3,55E+09	2,34E+07	2,10E+04	1,84E+07	6,05E-03	1093,8	1094,1
10	1,16E+03	1,16E+03	2,19E+07	6,08E+07	4,40E+07	5,29E+09	1,02E+10	1,24E+09	1,32E+07	1,34E+06	1,86E+07	3,11E-03	1317,0	1317,4
11	2,98E+03	2,98E+03	1,14E+08	1,51E+08	7,47E+07	2,76E+09	3,34E+09	2,99E+08	7,20E+06	6,83E+07	3,61E+07	2,85E-03	2794,3	2793,7
12	4,19E+03	4,19E+03	9,91E+07	8,02E+07	3,08E+07	1,24E+09	9,37E+08	7,37E+07	2,95E+06	6,92E+07	2,78E+07	1,43E-03	3871,7	3869,5
13	7,00E+03	7,00E+03	7,87E+07	3,97E+07	1,67E+07	5,00E+08	1,91E+08	1,30E+07	9,57E+05	4,75E+07	3,04E+07	8,84E-04	6849,2	6846,0
14	8,28E+03	8,28E+03	2,74E+07	7,78E+06	2,83E+06	1,66E+08	2,82E+07	1,61E+06	2,54E+05	1,06E+07	1,51E+07	2,96E-04	8038,2	8033,6

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,52E+02	5,52E+02	1,52E+06	1,14E+10	1,00E+00	2,34E+11	5,01E+13	1,34E+13	3,69E+09	1,00E+00	1,00E+00	1,74E+00	196,2	196,2
2	6,61E+02	6,61E+02	1,80E+06	1,59E+10	1,84E+06	3,35E+11	2,66E+13	7,03E+12	3,52E+09	1,00E+00	1,00E+00	1,02E+00	214,2	214,2
3	7,66E+02	7,66E+02	2,10E+06	1,04E+10	1,00E+00	4,42E+11	8,48E+12	2,07E+12	3,57E+09	1,00E+00	2,08E+00	4,00E-01	254,1	254,1
4	7,63E+02	7,63E+02	2,18E+06	3,90E+09	1,00E+00	3,36E+11	2,99E+12	6,42E+11	2,41E+09	1,00E+00	1,78E+01	1,78E-01	313,7	313,7
5	9,48E+02	9,48E+02	3,42E+06	3,25E+09	1,14E+07	1,65E+11	9,97E+11	1,87E+11	1,91E+09	1,00E+00	1,08E+03	1,10E-01	560,3	559,4
6	1,06E+03	1,06E+03	1,03E+07	1,87E+09	1,87E+08	6,91E+10	3,57E+11	6,22E+10	1,01E+09	1,00E+00	3,93E+06	6,03E-02	848,1	846,8
7	9,16E+02	9,16E+02	2,26E+07	5,17E+08	1,88E+08	3,54E+10	1,44E+11	2,26E+10	2,23E+08	1,00E+00	1,95E+07	2,79E-02	972,9	973,1
8	1,11E+03	1,11E+03	4,13E+07	3,47E+08	1,93E+08	1,91E+10	6,09E+10	8,59E+09	8,96E+07	1,24E+01	3,96E+07	1,52E-02	1213,2	1213,8
9	1,38E+03	1,38E+03	4,96E+07	2,49E+08	1,64E+08	1,05E+10	2,59E+10	3,29E+09	3,79E+07	1,33E+05	4,71E+07	8,30E-03	1466,5	1467,3
10	2,01E+03	2,01E+03	7,90E+07	2,07E+08	1,36E+08	5,63E+09	1,01E+10	1,07E+09	1,74E+07	1,34E+07	5,25E+07	5,05E-03	1997,3	2001,1
11	6,86E+03	6,86E+03	4,49E+08	6,08E+08	1,61E+08	3,07E+09	2,90E+09	1,34E+08	1,21E+07	3,51E+08	9,20E+07	7,96E-03	6953,2	6945,0
12	9,69E+03	9,69E+03	3,34E+08	2,85E+08	8,92E+07	1,25E+09	7,05E+08	3,35E+07	1,45E+07	2,43E+08	8,83E+07	4,30E-03	10111,1	10080,0
13	1,27E+04	1,27E+04	1,80E+08	8,09E+07	3,42E+07	4,67E+08	1,30E+08	7,48E+06	3,55E+06	1,08E+08	7,11E+07	2,07E-03	14152,6	14142,7
14	1,14E+04	1,14E+04	4,72E+07	1,21E+07	5,06E+06	1,55E+08	2,09E+07	1,14E+06	3,21E+05	1,85E+07	2,69E+07	5,31E-04	13620,8	13613,8

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,01E+02	7,01E+02	1,90E+06	4,12E+10	8,58E+06	2,60E+11	5,00E+13	1,34E+13	1,70E+09	1,00E+00	1,00E+00	1,92E+00	214,9	214,9
2	8,79E+02	8,79E+02	2,36E+06	5,82E+10	1,29E+07	3,70E+11	2,66E+13	7,01E+12	9,26E+08	1,00E+00	1,00E+00	1,27E+00	263,9	263,8
3	9,18E+02	9,18E+02	2,49E+06	2,12E+10	1,85E+07	4,60E+11	8,48E+12	2,07E+12	3,04E+09	1,00E+00	2,26E+00	4,91E-01	308,4	308,5
4	1,06E+03	1,06E+03	3,06E+06	1,22E+10	1,00E+00	3,76E+11	2,98E+12	6,18E+11	3,67E+09	1,00E+00	2,26E+01	3,20E-01	554,5	553,3
5	1,41E+03	1,41E+03	6,95E+06	6,97E+09	4,64E+00	2,00E+11	9,87E+11	1,66E+11	5,25E+09	1,00E+00	4,64E+03	2,30E-01	1144,3	1139,1
6	1,14E+03	1,14E+03	1,53E+07	2,18E+09	1,58E+08	8,23E+10	3,57E+11	5,53E+10	1,67E+09	1,00E+00	8,03E+06	9,71E-02	1354,0	1352,2
7	1,41E+03	1,41E+03	5,96E+07	1,60E+09	3,95E+08	4,21E+10	1,44E+11	1,93E+10	7,27E+08	2,88E+00	5,41E+07	5,10E-02	1699,7	1704,3
8	2,14E+03	2,14E+03	1,10E+08	1,58E+09	5,36E+08	2,29E+10	6,05E+10	6,82E+09	3,48E+08	6,85E+02	1,04E+08	3,10E-02	2314,8	2320,8
9	6,40E+03	6,40E+03	3,91E+08	4,06E+09	6,58E+08	1,65E+10	2,31E+10	4,64E+08	2,36E+08	2,78E+08	8,56E+07	4,43E-02	6365,3	6358,3
10	8,53E+03	8,53E+03	1,04E+09	3,55E+09	6,16E+08	7,04E+09	7,58E+09	2,18E+08	2,33E+08	8,78E+08	1,32E+08	2,65E-02	8700,2	8688,4
11	1,47E+04	1,47E+04	2,54E+09	2,16E+09	1,13E+09	2,83E+09	8,14E+08	1,00E+00	4,47E+07	2,06E+09	4,56E+08	2,83E-02	17052,5	16977,2
12	2,24E+04	2,24E+04	1,27E+09	4,38E+08	3,47E+08	1,01E+09	1,68E+08	1,00E+00	1,39E+07	8,97E+08	3,68E+08	1,51E-02	24911,7	24690,6
13	2,30E+04	2,30E+04	4,06E+08	9,84E+07	6,44E+07	3,76E+08	4,43E+07	1,72E+06	3,43E+06	2,31E+08	1,72E+08	5,46E-03	30373,6	30363,3
14	1,71E+04	1,71E+04	8,21E+07	1,59E+07	7,69E+06	1,35E+08	1,15E+07	5,73E+05	3,40E+05	3,16E+07	4,90E+07	1,01E-03	23987,6	24031,2

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 1,00 TDAT2 = 3,00

K	YEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,01E+03	1,01E+03	2,68E+06	1,85E+11	1,97E+06	3,80E+11	5,00E+13	1,34E+13	6,24E+07	1,00E+00	1,00E+00	2,75E+00	307,9	307,9
2	1,25E+03	1,25E+03	3,31E+06	1,81E+11	2,40E+06	5,01E+11	2,65E+13	6,95E+12	8,68E+08	1,00E+00	1,00E+00	2,10E+00	433,7	433,7
3	1,29E+03	1,29E+03	3,47E+06	5,07E+10	1,78E+07	5,96E+11	8,47E+12	2,00E+12	3,52E+09	1,00E+00	3,24E+00	9,88E-01	607,8	608,4
4	1,95E+03	1,95E+03	1,60E+07	1,02E+00	1,00E+00	6,37E+11	2,90E+12	4,48E+11	4,74E+10	1,00E+00	3,38E+01	1,15E+00	1976,7	1952,9
5	2,07E+03	2,07E+03	3,22E+07	1,05E+00	1,00E+00	3,23E+11	9,64E+11	9,02E+10	2,49E+10	1,00E+00	2,51E+03	6,34E-01	3143,4	3105,7
6	2,42E+03	2,42E+03	3,63E+07	2,09E+09	2,88E+07	1,44E+11	3,62E+11	2,31E+10	1,03E+10	3,22E+00	3,65E+06	3,18E-01	3918,3	3962,7
7	5,99E+03	5,99E+03	6,82E+07	1,26E+10	8,76E+08	8,78E+10	1,41E+11	1,00E+00	4,53E+09	3,01E+01	2,37E+05	2,57E-01	6886,5	7030,1
8	1,00E+04	1,00E+04	1,05E+10	8,08E+10	2,59E+10	2,83E+10	1,99E+09	1,00E+00	4,21E+08	1,00E+10	2,10E+08	2,86E-01	12931,9	12674,4
9	1,22E+04	1,22E+04	3,84E+10	1,27E+10	3,64E+09	9,16E+09	5,27E+07	1,00E+00	1,50E+06	3,16E+10	6,40E+09	1,68E-01	12173,9	11785,1
10	1,30E+04	1,30E+04	1,95E+10	3,94E+09	1,32E+09	3,95E+09	1,00E+00	1,00E+00	3,97E+04	1,52E+10	4,24E+09	8,64E-02	12909,0	12938,6
11	1,51E+04	1,51E+04	8,69E+09	6,05E+08	2,88E+08	9,06E+08	1,09E+06	1,00E+00	7,18E+03	6,18E+09	2,51E+09	4,03E-02	14989,1	15049,2
12	2,10E+04	2,10E+04	2,82E+09	1,55E+08	1,20E+08	3,61E+08	9,25E+05	1,00E+00	1,24E+04	1,77E+09	1,05E+09	1,84E-02	21092,7	21015,8
13	2,30E+04	2,30E+04	7,25E+08	5,59E+07	4,30E+07	2,05E+08	2,61E+06	5,29E+04	1,70E+05	3,78E+08	3,46E+08	9,91E-03	53682,3	53446,8
14	2,30E+04	2,30E+04	1,26E+08	1,54E+07	9,10E+06	1,06E+08	3,77E+06	1,63E+05	1,65E+05	4,63E+07	7,87E+07	1,88E-03	41856,1	41837,1

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 1,00 TDAT2 = 3,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,32E+03	1,32E+03	3,50E+06	1,58E+11	3,85E+06	1,01E+12	5,00E+13	1,30E+13	1,16E+10	1,00E+00	1,00E+00	5,48E+00	565,9	565,9
2	1,59E+03	1,59E+03	4,19E+06	4,42E+10	4,03E+06	1,00E+12	2,69E+13	6,78E+12	1,85E+10	1,00E+00	1,00E+00	3,85E+00	677,7	681,7
3	2,02E+03	2,02E+03	7,32E+06	4,88E+05	2,22E+07	1,30E+12	8,63E+12	1,63E+12	1,31E+11	1,00E+00	6,45E+00	3,13E+00	1824,2	1843,8
4	3,43E+03	3,43E+03	5,70E+08	3,16E+11	2,14E+08	1,46E+12	2,36E+12	1,00E+00	3,39E+11	1,00E+00	4,84E+01	4,55E+00	8665,8	8246,0
5	4,92E+03	4,92E+03	1,38E+09	4,06E+11	8,27E+08	7,84E+11	6,65E+11	1,00E+00	5,10E+10	1,57E+00	1,27E+02	2,86E+00	11694,8	11045,3
6	1,27E+04	1,27E+04	2,56E+10	4,95E+11	1,77E+11	1,80E+11	1,52E+09	1,00E+00	1,34E+00	2,01E+10	3,77E+09	1,56E+00	12341,7	12134,8
7	1,12E+04	1,12E+04	2,27E+11	7,04E+10	1,85E+10	2,75E+10	1,58E+02	1,00E+00	1,00E+00	1,79E+11	4,79E+10	9,57E-01	12105,9	11618,2
8	1,15E+04	1,15E+04	1,37E+11	1,00E+10	2,72E+09	4,00E+09	1,00E+00	1,00E+00	1,00E+00	1,06E+11	3,13E+10	4,86E-01	12115,1	11960,1
9	1,18E+04	1,18E+04	6,91E+10	2,06E+09	5,68E+08	1,05E+09	1,00E+00	1,00E+00	1,00E+00	5,22E+10	1,69E+10	2,39E-01	11888,1	12140,8
10	1,17E+04	1,17E+04	2,85E+10	3,03E+08	8,41E+07	1,64E+08	1,00E+00	1,00E+00	1,00E+00	2,07E+10	7,85E+09	9,45E-02	11702,7	11853,7
11	1,17E+04	1,17E+04	1,05E+10	3,46E+07	9,61E+06	3,06E+07	1,00E+00	1,00E+00	1,00E+00	7,09E+09	3,42E+09	3,42E-02	11633,6	11725,6
12	1,16E+04	1,16E+04	3,50E+09	2,92E+06	8,03E+05	3,51E+06	1,00E+00	1,00E+00	1,00E+00	2,07E+09	1,43E+09	1,13E-02	11598,0	11623,6
13	2,30E+04	2,30E+04	9,30E+08	1,92E+07	1,55E+07	6,82E+07	2,04E+04	2,78E+02	1,65E+03	4,47E+06	4,83E+08	1,02E-02	50973,5	50696,8
14	[illegible]	2,30E+04	1,48E+08	1,30E+07	8,42E+06	8,81E+07	1,73E+06	6,77E+04	8,16E+04	5,27E+07	9,42E+07	2,36E-03	53705,8	53322,6

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 10,0

KCYC= 14 TIMDEL= 2,500000E-02 TIMTOT= 1,880000E-01 TTX= 1,075900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,103355E+09	1,681851E+00
2	9,349662E+06	1,620120E-09	-5,972477E+01	9,995242E-01	1,142626E+09	9,255953E-01
3	1,000061E+07	5,158527E-10	1,731927E+02	9,984701E-01	1,297366E+09	3,346248E-01
4	1,062633E+07	1,825924E-10	3,079130E+02	9,999204E-01	1,509314E+09	1,377947E-01
5	1,132572E+07	6,087269E-11	2,121361E+02	9,965256E-01	2,021518E+09	6,152761E-02
6	1,210616E+07	2,161634E-11	1,316693E+03	9,872520E-01	3,057390E+09	3,304479E-02
7	1,296979E+07	8,781080E-12	3,982868E+03	9,914509E-01	4,233029E+09	1,858528E-02
8	1,406918E+07	3,824241E-12	3,902043E+03	1,003800E+00	5,097187E+09	9,746436E-03
9	1,551013E+07	1,679095E-12	2,051721E+03	1,005349E+00	6,346612E+09	5,328283E-03
10	1,760344E+07	6,845227E-13	6,631045E+02	1,002421E+00	7,921713E+09	2,711296E-03
11	2,069999E+07	2,525922E-13	-1,550945E+00	9,982767E-01	1,301346E+10	1,643550E-03
12	2,511795E+07	8,551231E-14	3,811506E+03	9,962328E-01	1,725017E+10	7,375508E-04
13	3,123301E+07	2,604716E-14	6,743055E+03	9,947386E-01	3,285051E+10	4,278313E-04
14	3,979116E+07	6,766408E-15	1,829981E+04	9,921166E-01	5,116557E+10	1,731036E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 7,93962E-02 CM, X= 5,00000E+00 SEC

TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 6,07051E-01 CM, X= 7,00000E+00 SEC

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 10,0

KCYC= 14 TIMDEL= 2,400000E-02 TIMTOT= 2,120000E-01 TTX= 1,079100E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,109190E+09	1,690746E+00
2	9,349231E+06	1,616267E-09	-1,384632E+02	9,972676E-01	1,173760E+09	9,485549E-01
3	1,000375E+07	5,160252E-10	7,787044E+02	9,987549E-01	1,391092E+09	3,589192E-01
4	1,062569E+07	1,832256E-10	2,185265E+02	1,003159E+00	1,578866E+09	1,446443E-01
5	1,132505E+07	6,013150E-11	1,340751E+02	9,852597E-01	2,426164E+09	7,294444E-02
6	1,212176E+07	2,127052E-11	4,435103E+03	9,725627E-01	3,862208E+09	4,107559E-02
7	1,299031E+07	8,806159E-12	8,100800E+03	9,941316E-01	4,921311E+09	2,166893E-02
8	1,407836E+07	3,848758E-12	5,808272E+03	1,009804E+00	5,883234E+09	1,132157E-02
9	1,551893E+07	1,685099E-12	3,816750E+03	1,008691E+00	7,280163E+09	6,133896E-03
10	1,760051E+07	6,905107E-13	4,869713E+01	1,010596E+00	9,145089E+09	3,157391E-03
11	2,067016E+07	2,512087E-13	-6,043340E+03	9,931681E-01	2,243001E+10	2,817306E-03
12	2,516942E+07	8,426409E-14	1,450371E+04	9,826838E-01	3,296424E+10	1,388851E-03
13	3,131861E+07	2,585078E-14	2,408801E+04	9,878453E-01	6,712746E+10	8,676486E-04
14	3,993267E+07	6,710249E-15	4,657399E+04	9,845277E-01	8,625993E+10	2,894126E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 6,99659E-01 CM, X= 5,00000E+00 SEC

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 10,0

KCYC= 15 TIMDEL= 2,500000E-02 TIMTOT= 2,370000E-01 TTX= 1,082500E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,142658E+09	1,741760E+00
2	9,349605E+06	1,614614E-09	-5,755646E+01	9,963641E-01	1,261237E+09	1,018205E+00
3	1,000545E+07	5,163961E-10	1,141115E+03	9,993779E-01	1,547962E+09	3,996807E-01
4	1,062558E+07	1,819707E-10	2,936802E+02	9,967817E-01	1,951199E+09	1,775305E-01
5	1,133603E+07	5,872559E-11	2,530512E+03	9,645159E-01	3,536949E+09	1,038547E-01
6	1,216285E+07	2,109732E-11	1,239445E+04	9,659140E-01	5,422495E+09	5,720006E-02
7	1,302255E+07	8,928834E-12	1,461422E+04	1,006919E+00	6,309804E+09	2,816960E-02
8	1,409399E+07	3,865849E-12	9,101931E+03	1,013784E+00	8,037523E+09	1,553593E-02
9	1,553879E+07	1,695761E-12	7,671626E+03	1,014442E+00	9,998814E+09	8,477798E-03
10	1,758142E+07	7,156098E-13	-4,237752E+03	1,043683E+00	1,503718E+10	5,360376E-03
11	2,048365E+07	2,469175E-13	-3,906662E+04	9,783552E-01	6,238788E+10	7,702330E-03
12	2,546325E+07	7,978569E-14	7,046269E+04	9,357099E-01	9,763790E+10	3,895053E-03
13	3,168566E+07	2,576392E-14	9,716936E+04	9,850439E-01	1,571013E+11	2,023773E-03
14	4,027551E+07	6,741712E-15	1,150502E+05	9,890059E-01	1,550231E+11	5,225605E-04

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 10,0
KCYC= 20 TIMDEL= 3,700000E-02 TIMTOT= 2,740000E-01 TTX= 1,087100E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,258876E+09	1,918913E+00
2	9,352210E+06	1,612214E-09	4,404870E+02	9,949295E-01	1,560822E+09	1,258189E+00
3	1,000512E+07	5,191432E-10	1,126758E+03	1,004021E+00	1,901120E+09	4,934766E-01
4	1,062147E+07	1,736561E-10	1,886181E+02	9,554326E-01	3,442119E+09	2,988725E-01
5	1,140913E+07	5,463105E-11	1,660929E+04	9,033614E-01	7,234838E+09	1,976234E-01
6	1,226442E+07	2,135304E-11	3,159577E+04	9,772650E-01	8,782732E+09	9,376902E-02
7	1,307845E+07	9,588912E-12	2,546215E+04	1,075474E+00	1,185705E+10	5,684811E-02
8	1,406001E+07	4,380413E-12	7,819445E+02	1,136999E+00	1,714276E+10	3,754618E-02
9	1,528912E+07	1,655342E-12	-3,140412E+04	9,937710E-01	5,302074E+10	4,388373E-02
10	1,788897E+07	6,551000E-13	5,017646E+04	9,622040E-01	7,641824E+10	2,503080E-02
11	2,066279E+07	2,363115E-13	2,477831E+04	9,433735E-01	2,197073E+11	2,595968E-02
12	2,647087E+07	7,145730E-14	2,483017E+05	8,492039E-01	3,312946E+11	1,183671E-02
13	3,300415E+07	2,577729E-14	3,515500E+05	9,847430E-01	4,137901E+11	5,333194E-03
14	4,113465E+07	7,104570E-15	2,902965E+05	1,036789E+00	3,011060E+11	1,069614E-03

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 10,0
KCYC= 20 TIMDEL= 3,600000E-02 TIMTOT= 3,100000E-01 TTX= 1,091500E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,806114E+09	2,753071E+00
2	9,359429E+06	1,614557E-09	1,660440E+03	9,959916E-01	2,590510E+09	2,091263E+00
3	9,997600E+06	5,112958E-10	2,560274E+02	9,875087E-01	3,791685E+09	9,693362E-01
4	1,064822E+07	1,472815E-10	1,216064E+04	8,287144E-01	1,179254E+10	8,684115E-01
5	1,170165E+07	5,170940E-11	5,893512E+04	8,697357E-01	1,987527E+10	5,138691E-01
6	1,244719E+07	2,653935E-11	5,554712E+04	1,181305E+00	3,075015E+10	4,080445E-01
7	1,305803E+07	1,044294E-11	6,054217E+04	1,123199E+00	5,865154E+10	3,062474E-01
8	1,419703E+07	2,761110E-12	1,068317E+05	7,589324E-01	1,371838E+11	1,893898E-01
9	1,698546E+07	1,086219E-12	2,300380E+05	7,013253E-01	1,816551E+11	9,865864E-02
10	1,944273E+07	6,519952E-13	3,284688E+05	9,498727E-01	2,452346E+11	7,994588E-02
11	2,234485E+07	2,652825E-13	3,431363E+05	1,038697E+00	3,219741E+11	4,270706E-02
12	2,657932E+07	8,089731E-14	3,126201E+05	9,500620E-01	4,208232E+11	1,702173E-02
13	3,371004E+07	2,388118E-14	4,741480E+05	9,207008E-01	7,330070E+11	8,752538E-03
14	4,235444E+07	6,658238E-15	5,281360E+05	9,766081E-01	5,450220E+11	1,814443E-03

TIME STEP IS HALVED, IHLF= 2, H= 2,50000E-01 SEC, DELT= 1,16810E+02 CM, XF 4,50000E+00 SEC

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 10,0
KCYC= 38 TIMDEL= 6,500000E-02 TIMTOT= 3,750000E-01 TTX= 1,098800E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	3,597707E+09	5,484007E+00
2	9,367805E+06	1,802307E-09	4,100385E+02	1,097741E+00	4,909071E+09	4,423826E+00
3	9,876484E+06	5,273552E-10	-6,352383E+03	9,976576E-01	1,184685E+10	3,123749E+00
4	1,069113E+07	9,520704E-11	5,479615E+04	5,821132E-01	4,247020E+10	2,021731E+00
5	1,274460E+07	2,556880E-11	2,148727E+05	4,737843E-01	7,303760E+10	9,337420E-01
6	1,414338E+07	1,242790E-11	3,372398E+05	5,900213E-01	1,140732E+11	7,088448E-01
7	1,561242E+07	5,438918E-12	4,641835E+05	6,778113E-01	1,963154E+11	5,338716E-01
8	1,725590E+07	3,026780E-12	5,299730E+05	8,195103E-01	2,380614E+11	3,602797E-01
9	1,878311E+07	1,848834E-12	5,935908E+05	1,054979E+00	2,802528E+11	2,590705E-01
10	2,041765E+07	8,988382E-13	6,138644E+05	1,279216E+00	3,043090E+11	1,367623E-01
11	2,268100E+07	3,311047E-13	4,363678E+05	1,285560E+00	3,012760E+11	4,987695E-02
12	2,616484E+07	9,361167E-14	2,419285E+05	1,084929E+00	2,719058E+11	1,272678E-02
13	3,273252E+07	2,337817E-14	3,099287E+05	9,034377E-01	7,469706E+11	8,731402E-03
14	4,257675E+07	5,842902E-15	5,548279E+05	8,700823E-01	6,569253E+11	1,919175E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1   TDAT1 = 3,00   TDAT2 = 10,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,50E+02	4,50E+02	3,80E+05	2,34E+09	6,13E+05	2,25E+11	5,01E+13	1,34E+13	1,22E+09	1,00E+00	1,00E+00	1,68E+00	191,1	191,1
2	4,76E+02	4,76E+02	3,99E+05	1,88E+09	6,45E+05	3,21E+11	2,66E+13	7,04E+12	1,19E+09	1,00E+00	1,00E+00	9,28E-01	197,4	197,3
3	5,69E+02	5,69E+02	4,75E+05	1,82E+09	7,93E+05	4,31E+11	8,47E+12	2,08E+12	1,17E+09	1,00E+00	1,95E+00	3,37E-01	220,9	220,7
4	6,06E+02	6,06E+02	5,08E+05	1,07E+09	8,67E+05	3,26E+11	3,00E+12	6,48E+11	8,71E+08	1,00E+00	1,59E+01	1,38E-01	251,2	251,1
5	6,40E+02	6,40E+02	5,50E+05	5,49E+08	5,44E+05	1,51E+11	9,99E+11	1,94E+11	4,98E+08	1,00E+00	8,35E+01	6,17E-02	331,6	331,0
6	7,42E+02	7,42E+02	7,34E+05	4,27E+08	1,50E+06	6,07E+10	3,54E+11	6,57E+10	3,75E+08	1,00E+00	2,88E+02	3,34E-02	500,1	496,9
7	7,99E+02	7,99E+02	1,56E+06	2,63E+08	2,01E+07	3,21E+10	1,43E+11	2,39E+10	2,13E+08	1,00E+00	2,85E+05	1,90E-02	678,3	675,4
8	6,93E+02	6,93E+02	2,74E+06	7,34E+07	2,10E+07	1,77E+10	6,13E+10	9,40E+09	5,51E+07	1,00E+00	1,90E+06	9,84E-03	795,9	797,5
9	7,70E+02	7,70E+02	5,81E+06	4,92E+07	2,30E+07	9,84E+09	2,62E+10	3,66E+09	2,83E+07	3,27E+00	5,36E+06	5,37E-03	965,8	968,4
10	9,19E+02	9,19E+02	7,56E+06	3,17E+07	1,85E+07	1,24E+09	1,02E+10	1,28E+09	1,45E+07	2,72E+03	7,25E+06	2,73E-03	1165,9	1167,3
11	1,79E+03	1,79E+03	2,39E+07	6,24E+07	3,41E+07	2,08E+09	3,44E+09	3,43E+08	8,18E+06	3,81E+06	1,54E+07	1,74E-03	1801,0	1799,4
12	2,40E+03	2,40E+03	2,83E+07	3,26E+07	1,37E+07	1,24E+09	9,94E+08	8,26E+07	3,05E+06	1,45E+07	1,15E+07	7,77E-04	2204,1	2200,0
13	4,29E+03	4,29E+03	3,15E+07	2,02E+07	7,41E+06	5,11E+08	2,19E+08	1,48E+07	1,02E+06	1,84E+07	1,28E+07	4,37E-04	3667,4	3657,7
14	5,76E+03	5,76E+03	1,48E+07	5,16E+06	2,17E+06	1,72E+08	3,26E+07	1,88E+06	2,49E+05	6,05E+06	8,52E+06	1,74E-04	5022,3	5002,4

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2   TDAT1 = 3,00   TDAT2 = 10,00

K	TEL	TVIBN2	FNE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,68E+02	4,68E+02	3,96E+05	2,97E+09	6,37E+05	2,27E+11	5,01E+13	1,34E+13	1,17E+09	1,00E+00	1,00E+00	1,69E+00	192,1	192,1
2	5,42E+02	5,42E+02	4,54E+05	3,79E+09	7,29E+05	3,25E+11	2,65E+13	7,02E+12	1,03E+09	1,00E+00	1,00E+00	9,54E-01	203,0	202,7
3	6,59E+02	6,59E+02	5,49E+05	3,49E+09	9,11E+05	4,37E+11	8,47E+12	2,07E+12	1,07E+09	1,00E+00	1,99E+00	3,64E-01	236,7	236,6
4	6,31E+02	6,31E+02	5,31E+05	1,28E+09	9,08E+05	3,29E+11	3,01E+12	6,49E+11	9,71E+08	1,00E+00	1,63E+01	1,46E-01	262,2	262,6
5	7,48E+02	7,48E+02	6,45E+05	1,07E+09	5,98E+05	1,53E+11	9,87E+11	1,90E+11	8,15E+08	1,00E+00	9,17E+01	7,35E-02	399,5	396,6
6	8,95E+02	8,95E+02	9,28E+05	8,66E+08	3,91E+05	6,24E+10	3,48E+11	6,32E+10	6,45E+08	1,00E+00	3,88E+02	4,19E-02	634,4	625,6
7	8,50E+02	8,50E+02	1,89E+06	3,55E+08	2,24E+07	3,33E+10	1,43E+11	2,34E+10	2,75E+08	1,00E+00	4,35E+05	2,22E-02	785,2	782,9
8	8,19E+02	8,19E+02	5,33E+06	1,42E+08	3,89E+07	1,83E+10	6,16E+10	9,20E+09	9,13E+07	1,36E+00	4,26E+06	1,15E-02	913,0	917,5
9	9,51E+02	9,51E+02	1,14E+07	9,21E+07	4,45E+07	1,01E+10	2,63E+10	3,56E+09	4,13E+07	6,40E+00	1,08E+07	6,22E-03	1101,9	1106,7
10	1,18E+03	1,18E+03	1,56E+07	6,68E+07	3,95E+07	5,37E+09	1,03E+10	1,24E+09	1,88E+07	6,62E+03	1,51E+07	3,20E-03	1334,1	1341,1
11	3,19E+03	3,19E+03	6,14E+07	1,90E+08	7,08E+07	2,86E+09	3,31E+09	2,45E+08	1,15E+07	2,08E+07	2,98E+07	3,12E-03	3005,2	2994,9
12	4,40E+03	4,40E+03	7,87E+07	9,64E+07	2,85E+07	1,26E+09	9,19E+08	5,56E+07	3,01E+06	5,08E+07	2,52E+07	1,50E-03	4007,1	3972,2
13	6,95E+03	6,95E+03	7,32E+07	4,60E+07	1,53E+07	5,02E+08	1,87E+08	1,01E+07	9,11E+05	4,39E+07	2,87E+07	8,87E-04	6940,9	6898,5
14	7,73E+03	7,73E+03	2,53E+07	8,63E+06	3,76E+06	1,65E+08	2,75E+07	1,51E+06	3,18E+05	1,04E+07	1,47E+07	2,91E-04	8119,6	8056,5

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3   TDAT1 = 3,00   TDAT2 = 10,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,43E+02	5,43E+02	4,59E+05	8,14E+09	7,34E+05	2,37E+11	5,01E+13	1,34E+13	4,28E+08	1,00E+00	1,00E+00	1,75E+00	197,9	197,9
2	6,54E+02	6,54E+02	5,45E+05	1,25E+10	5,05E+05	3,37E+11	2,65E+13	7,00E+12	1,75E+08	1,00E+00	1,00E+00	1,03E+00	218,1	217,7
3	7,63E+02	7,63E+02	6,35E+05	7,31E+09	1,04E+06	4,45E+11	8,48E+12	2,07E+12	5,02E+08	1,00E+00	2,13E+00	4,08E-01	263,2	263,1
4	7,62E+02	7,62E+02	6,39E+05	2,63E+09	1,10E+06	3,37E+11	2,99E+12	6,40E+11	1,16E+09	1,00E+00	1,82E+01	1,81E-01	324,6	324,1
5	9,47E+02	9,47E+02	8,18E+05	2,27E+09	9,02E+05	1,60E+11	9,63E+11	1,80E+11	1,24E+09	1,00E+00	1,06E+02	1,06E-01	586,1	575,6
6	1,06E+03	1,06E+03	1,16E+06	1,32E+09	1,00E+00	6,74E+10	3,45E+11	5,97E+10	1,04E+09	1,00E+00	6,82E+02	5,88E-02	888,1	872,8
7	9,17E+02	9,17E+02	2,46E+06	4,68E+08	2,43E+07	3,60E+10	1,45E+11	2,26E+10	3,79E+08	1,00E+00	7,59E+05	2,89E-02	994,6	998,0
8	1,12E+03	1,12E+03	1,16E+07	3,48E+08	8,00E+07	1,96E+10	6,17E+10	8,56E+09	2,06E+08	3,55E+00	9,97E+06	1,61E-02	1234,3	1242,8
9	1,41E+03	1,41E+03	2,59E+07	2,73E+08	1,09E+08	1,07E+10	2,63E+10	3,27E+09	9,32E+07	1,94E+01	2,48E+07	8,74E-03	1493,2	1504,0
10	2,10E+03	2,10E+03	4,11E+07	2,56E+08	1,18E+08	5,98E+09	1,05E+10	1,07E+09	4,22E+07	1,23E+05	3,82E+07	5,59E-03	2113,7	2159,4
11	7,49E+03	7,49E+03	2,95E+08	1,00E+09	1,44E+08	3,11E+09	2,69E+09	7,10E+07	5,99E+07	2,40E+08	4,72E+07	8,11E-03	7441,8	7360,9
12	9,88E+03	9,88E+03	2,42E+08	4,30E+08	9,46E+07	1,23E+09	5,98E+08	9,17E+06	2,61E+07	1,79E+08	6,01E+07	4,10E-03	10283,9	9947,8
13	1,26E+04	1,26E+04	1,64E+08	1,07E+08	3,94E+07	4,70E+08	1,14E+08	3,67E+06	7,42E+06	9,85E+07	6,43E+07	2,06E-03	14032,4	13927,0
14	1,15E+04	1,15E+04	4,47E+07	1,37E+07	6,07E+06	1,55E+08	2,00E+07	1,03E+06	6,25E+05	1,81E+07	2,63E+07	5,24E-04	13604,0	13529,0

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 3,00 TDAT2 = 10,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6,67E+02	6,87E+02	5,80E+05	3,95E+10	5,14E+05	2,62E+11	5,00E+13	1,34E+13	4,16E+06	1,00E+00	1,00E+00	1,92E+00	217,9	217,9
2	8,69E+02	8,69E+02	7,21E+05	5,68E+10	6,00E+05	3,69E+11	2,64E+13	6,98E+12	7,82E+06	1,00E+00	1,00E+00	1,26E+00	269,8	269,2
3	9,15E+02	9,15E+02	7,63E+05	1,83E+10	8,95E+05	4,65E+11	8,52E+12	2,07E+12	1,66E+08	1,00E+00	2,32E+00	5,01E-01	322,1	322,7
4	1,06E+03	1,06E+03	8,54E+05	7,40E+09	1,47E+06	3,63E+11	2,85E+12	5,89E+11	1,24E+09	1,00E+00	2,28E+01	3,09E-01	581,4	568,3
5	1,41E+03	1,41E+03	1,22E+06	4,25E+08	3,50E+06	1,86E+11	8,95E+11	1,47E+11	5,34E+09	1,00E+00	1,26E+02	2,08E-01	1220,8	1160,3
6	1,14E+03	1,14E+03	1,69E+06	7,53E+08	1,00E+00	8,20E+10	3,49E+11	5,30E+10	2,15E+09	1,00E+00	2,45E+03	9,66E-02	1410,7	1394,6
7	1,41E+03	1,41E+03	4,93E+06	9,15E+08	3,40E+07	4,66E+10	1,55E+11	1,98E+10	1,35E+09	2,35E+00	1,36E+06	5,97E-02	1774,4	1640,2
8	2,15E+03	2,15E+03	1,63E+07	1,22E+09	1,71E+08	2,73E+10	6,90E+10	6,83E+09	9,62E+08	1,77E+01	1,02E+07	4,05E-02	2415,1	2575,2
9	6,62E+03	6,62E+03	2,04E+07	3,91E+09	5,19E+08	1,78E+10	2,32E+10	1,00E+00	4,66E+08	1,16E+05	5,34E+05	4,75E-02	7017,9	6996,0
10	8,41E+03	8,41E+03	1,06E+08	6,13E+09	9,81E+08	7,20E+09	6,24E+09	1,00E+00	5,61E+08	7,79E+07	8,54E+06	2,76E-02	9036,0	8863,6
11	1,46E+04	1,46E+04	1,85E+09	3,46E+09	1,54E+09	2,73E+09	1,68E+08	1,00E+00	3,42E+07	1,53E+09	3,00E+08	2,71E-02	17646,8	17139,9
12	2,08E+04	2,08E+04	1,00E+09	5,11E+08	4,15E+08	8,75E+08	5,94E+07	1,00E+00	9,80E+06	7,06E+08	2,89E+08	1,20E-02	24964,5	23005,3
13	2,30E+04	2,30E+04	3,86E+08	1,10E+08	9,01E+07	3,77E+08	2,96E+07	1,00E+00	5,30E+06	2,18E+08	1,65E+08	5,36E-03	30347,5	30115,1
14	1,91E+04	1,91E+04	8,31E+07	1,81E+07	9,66E+06	1,42E+08	1,09E+07	4,98E+05	8,06E+05	3,25E+07	5,04E+07	1,07E-03	23360,8	23786,6

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 3,00 TDAT2 = 10,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	9,82E+02	9,82E+02	8,28E+05	1,80E+11	7,54E+05	3,85E+11	5,00E+13	1,33E+13	7,02E+07	1,00E+00	1,00E+00	2,76E+00	312,0	312,0
2	1,24E+03	1,24E+03	1,02E+06	1,19E+11	9,16E+05	5,60E+11	2,65E+13	6,89E+12	1,07E+09	1,00E+00	1,00E+00	2,20E+00	446,0	445,1
3	1,29E+03	1,29E+03	1,05E+06	1,10E+10	7,78E+05	6,27E+11	8,39E+12	1,96E+12	3,81E+09	1,00E+00	3,41E+00	1,04E+00	642,9	638,9
4	1,95E+03	1,95E+03	1,68E+06	2,90E+06	7,97E+06	5,26E+11	2,40E+12	3,71E+11	4,74E+10	1,00E+00	3,34E+01	8,68E-01	2069,1	1683,6
5	2,07E+03	2,07E+03	1,99E+06	6,80E+06	1,77E+07	2,81E+11	8,39E+11	7,85E+10	2,49E+10	1,00E+00	1,72E+02	5,14E-01	3270,0	3049,6
6	2,42E+03	2,42E+03	6,86E+06	2,42E+08	1,68E+07	1,72E+11	4,29E+11	2,58E+10	1,11E+10	1,00E+00	4,79E+02	4,12E-01	4250,2	4619,4
7	5,98E+03	5,98E+03	6,87E+07	1,43E+10	2,89E+08	9,92E+10	1,59E+11	1,00E+00	3,96E+09	6,01E+00	3,46E+02	3,09E-01	7540,5	7991,5
8	1,15E+04	1,15E+04	6,22E+09	6,97E+10	1,95E+10	2,04E+10	1,00E+00	1,00E+00	3,49E+07	4,67E+09	5,85E+08	1,96E-01	13318,2	11602,4
9	1,01E+04	1,01E+04	2,50E+10	1,10E+10	3,41E+09	6,14E+09	1,00E+00	1,00E+00	8,04E+03	1,99E+10	4,98E+09	1,00E-01	11682,1	9783,2
10	1,25E+04	1,25E+04	1,79E+10	4,31E+09	1,52E+09	3,60E+09	6,97E+02	1,00E+00	1,00E+00	1,37E+10	4,26E+09	8,03E-02	12927,7	12599,5
11	1,53E+04	1,53E+04	8,93E+09	7,11E+08	3,30E+08	9,35E+08	1,00E+00	1,00E+00	3,10E+02	6,31E+09	2,61E+09	4,27E-02	15328,9	15624,2
12	2,08E+04	2,08E+04	2,67E+09	1,54E+08	1,16E+08	3,42E+08	3,18E+04	1,00E+00	3,38E+03	1,68E+09	9,97E+08	1,70E-02	21358,0	20817,9
13	2,30E+04	2,30E+04	6,67E+08	5,14E+07	4,31E+07	1,89E+08	1,32E+06	1,00E+00	1,71E+05	3,47E+08	3,19E+08	8,76E-03	53369,9	51210,1
14	2,30E+04	2,30E+04	1,22E+08	1,48E+07	1,07E+07	1,04E+08	3,19E+06	1,21E+05	3,64E+05	4,50E+07	7,66E+07	1,82E-03	41093,0	40609,6

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 3,00 TDAT2 = 10,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,29E+03	1,29E+03	1,09E+06	6,83E+03	9,39E+05	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	618,6	618,6
2	1,57E+03	1,57E+03	1,43E+06	1,32E+04	1,45E+06	1,15E+12	2,96E+13	7,41E+12	3,42E+10	1,00E+00	1,00E+00	4,51E+00	800,9	839,1
3	2,01E+03	2,01E+03	5,26E+06	2,42E+06	1,32E+00	1,30E+12	8,61E+12	1,63E+12	1,31E+11	1,00E+00	7,00E+00	3,12E+00	1941,4	1939,1
4	3,43E+03	3,43E+03	3,17E+08	3,57E+10	3,68E+07	9,96E+11	1,52E+12	1,00E+00	1,90E+11	1,00E+00	2,95E+01	2,41E+00	7371,0	5623,8
5	4,91E+03	4,91E+03	5,08E+08	1,92E+11	2,06E+08	3,74E+11	3,17E+11	1,00E+00	4,87E+10	2,67E+00	6,78E+01	9,42E-01	10852,0	7469,6
6	7,57E+03	7,57E+03	9,76E+09	3,10E+11	1,04E+11	1,04E+11	1,00E+00	1,00E+00	2,97E+06	4,27E+09	4,33E+09	7,31E-01	12506,0	9609,5
7	9,81E+03	9,81E+03	1,09E+11	8,56E+10	1,79E+10	1,96E+10	1,00E+00	1,00E+00	1,00E+00	7,79E+10	3,15E+10	5,44E-01	12806,4	10543,4
8	1,07E+04	1,07E+04	9,15E+10	2,15E+10	5,86E+09	7,13E+09	1,00E+00	1,00E+00	1,00E+00	6,97E+10	2,17E+10	3,62E-01	12606,1	11411,9
9	1,20E+04	1,20E+04	6,50E+10	6,83E+09	1,96E+09	3,08E+09	1,00E+00	1,00E+00	1,00E+00	4,91E+10	1,59E+10	2,59E-01	12589,9	12931,4
10	1,25E+04	1,25E+04	3,47E+10	1,37E+09	3,88E+08	7,05E+08	1,00E+00	1,00E+00	1,00E+00	2,52E+10	9,54E+09	1,37E-01	12050,0	13628,8
11	1,25E+04	1,25E+04	1,33E+10	1,62E+08	4,54E+07	1,39E+08	1,00E+00	1,00E+00	1,00E+00	8,97E+09	4,29E+09	4,99E-02	11813,7	13394,6
12	1,19E+04	1,19E+04	3,78E+09	1,08E+07	3,02E+06	1,30E+07	1,00E+00	1,00E+00	1,00E+00	2,24E+09	1,54E+09	1,27E-02	11648,7	12133,3
13	2,30E+04	2,30E+04	8,40E+08	1,74E+07	1,46E+07	6,16E+07	1,00E+04	1,00E+00	4,54E+02	4,04E+08	4,36E+08	8,73E-03	50569,5	48084,9
14	2,30E+04	2,30E+04	1,28E+08	1,11E+07	8,48E+06	7,72E+07	1,29E+06	4,38E+04	1,58E+05	4,58E+07	8,19E+07	1,92E-03	52967,8	49407,4

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 30,0
KCYC= 25 TIMDEL= 3,100000E-02 TIMTOT= 4,060000E-01 TTX= 1,116700E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,105298E+09	1,684812E+00
2	9,348729E+06	1,613039E-09	3,015468E+01	9,956293E-01	1,142622E+09	9,215470E-01
3	1,000740E+07	5,099756E-10	4,278603E+02	9,886070E-01	1,297250E+09	3,307629E-01
4	1,064001E+07	1,813362E-10	9,736957E+02	9,931203E-01	1,511072E+09	1,370060E-01
5	1,134115E+07	5,938431E-11	1,521925E+03	9,755494E-01	2,003565E+09	5,949016E-02
6	1,215954E+07	2,014020E-11	4,061437E+03	9,317121E-01	2,985188E+09	3,006115E-02
7	1,310733E+07	8,313605E-12	6,595482E+03	9,467633E-01	4,204857E+09	1,747876E-02
8	1,422437E+07	3,878451E-12	1,109450E+04	1,014175E+00	5,183318E+09	1,005162E-02
9	1,560311E+07	1,742946E-12	7,607167E+03	1,038027E+00	6,517509E+09	5,679632E-03
10	1,763245E+07	6,986917E-13	2,512475E+03	1,020694E+00	8,057469E+09	2,814843E-03
11	2,069816E+07	2,489792E-13	2,255916E+02	9,856961E-01	1,365977E+10	1,700499E-03
12	2,529388E+07	8,297268E-14	1,339363E+04	9,703011E-01	1,791017E+10	7,430274E-04
13	3,152679E+07	2,514172E-14	2,274153E+04	9,652383E-01	3,299350E+10	4,147566E-04
14	4,052674E+07	6,420290E-15	5,459790E+04	9,488475E-01	5,021258E+10	1,611896E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 7,25216E-02 CM, X= 1,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 5,14085E-01 CM, X= 1,40000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 30,0
KCYC= 28 TIMDEL= 3,700000E-02 TIMTOT= 4,430000E-01 TTX= 1,121200E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,111940E+09	1,694937E+00
2	9,347458E+06	1,586517E-09	1,669541E+02	9,815936E-01	1,169645E+09	9,278308E-01
3	1,003062E+07	5,084898E-10	1,511299E+03	9,853472E-01	1,399734E+09	3,558753E-01
4	1,064465E+07	1,835095E-10	1,832347E+03	1,001550E+00	1,590037E+09	1,458935E-01
5	1,135084E+07	5,571642E-11	3,153479E+03	9,265762E-01	2,354573E+09	6,559418E-02
6	1,227407E+07	1,839429E-11	9,796255E+03	8,647784E-01	3,662286E+09	3,368257E-02
7	1,326491E+07	8,363652E-12	1,693536E+04	9,497730E-01	4,910496E+09	2,053533E-02
8	1,432686E+07	4,008872E-12	1,900278E+04	1,041602E+00	6,109975E+09	1,224705E-02
9	1,565501E+07	1,807246E-12	1,306013E+04	1,072487E+00	7,648130E+09	6,911027E-03
10	1,760261E+07	7,475293E-13	6,105252E+02	1,082575E+00	9,637096E+09	3,602006E-03
11	2,044669E+07	2,414660E-13	-1,193824E+04	9,612965E-01	2,438035E+10	2,943756E-03
12	2,579040E+07	7,447982E-14	4,432795E+04	8,838856E-01	3,337558E+10	1,242904E-03
13	3,232647E+07	2,388054E-14	7,597276E+04	9,237842E-01	6,598986E+10	7,879368E-04
14	4,177348E+07	6,085468E-15	1,350798E+05	9,068916E-01	8,263678E+10	2,514417E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 3,06588E-01 CM, X= 1,20000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 30,0
KCYC= 37 TIMDEL= 5,400000E-02 TIMTOT= 4,970000E-01 TTX= 1,127400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,148229E+09	1,750253E+00
2	9,351282E+06	1,565990E-09	4,201431E+02	9,698852E-01	1,252717E+09	9,808715E-01
3	1,004572E+07	5,023292E-10	2,359773E+03	9,727594E-01	1,557196E+09	3,911124E-01
4	1,066502E+07	1,722265E-10	4,246098E+03	9,464521E-01	1,933224E+09	1,664762E-01
5	1,146168E+07	4,816981E-11	1,043223E+04	8,202524E-01	3,269794E+09	7,875267E-02
6	1,255669E+07	1,707470E-11	2,331284E+04	8,093301E-01	5,015813E+09	4,282174E-02
7	1,353376E+07	8,778125E-12	3,255519E+04	9,831210E-01	6,417017E+09	2,816469E-02
8	1,451722E+07	4,234459E-12	3,414141E+04	1,095350E+00	8,702458E+09	1,842510E-02
9	1,582581E+07	2,055543E-12	1,910317E+04	1,212166E+00	1,135376E+10	1,166907E-02
10	1,737048E+07	9,392009E-13	-1,538745E+04	1,312446E+00	1,790913E+10	8,410136E-03
11	1,960153E+07	2,359399E-13	-1,267170E+04	9,555415E-01	6,420657E+10	7,574448E-03
12	2,783061E+07	5,397942E-14	1,503492E+05	6,765552E-01	8,456554E+10	2,282399E-03
13	3,534340E+07	2,209740E-14	2,549946E+05	8,576877E-01	1,477653E+11	1,632614E-03
14	4,479506E+07	6,046051E-15	3,313108E+05	8,968125E-01	1,472937E+11	4,452726E-04

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 30,0
KCYC= 60 TIMDEL= 9,200000E-02 TIMTOT= 5,890000E-01 TTX= 1,137500E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,261822E+09	1,923403E+00
2	9,366829E+06	1,530526E-09	8,922822E+02	9,530533E-01	1,527020E+09	1,173153E+00
3	1,005721E+07	4,830438E-10	4,071494E+03	9,304636E-01	1,862697E+09	4,498821E-01
4	1,073374E+07	1,355691E-10	1,274648E+04	7,806760E-01	3,140528E+09	2,128793E-01
5	1,193940E+07	3,687274E-11	3,145379E+04	6,749410E-01	6,270016E+09	1,155963E-01
6	1,309301E+07	2,114463E-11	3,610258E+04	9,902396E-01	9,005996E+09	9,521421E-02
7	1,374733E+07	1,266779E-11	3,570434E+04	1,321087E+00	1,431565E+10	9,067383E-02
8	1,444668E+07	5,566794E-12	6,221124E+04	1,270838E+00	2,083097E+10	5,798087E-02
9	1,552376E+07	1,515325E-12	9,079970E+04	9,154146E-01	5,488370E+10	4,158330E-02
10	1,928622E+07	4,554495E-13	9,129697E+04	6,952365E-01	7,021548E+10	1,598980E-02
11	2,297009E+07	1,521074E-13	2,041583E+05	6,436735E-01	1,836968E+11	1,347098E-02
12	3,454726E+07	3,770104E-14	5,147915E+05	5,276024E-01	2,438486E+11	4,596672E-03
13	4,452069E+07	1,998435E-14	7,254191E+05	7,752697E-01	3,665119E+11	3,662252E-03
14	5,301965E+07	6,564481E-15	8,925000E+05	9,239601E-01	2,898338E+11	9,513041E-04

TIME STEP IS DOUBLED, THLF= 0, H= 1,00000E+00 SEC, DELT= 1,87060E+00 CM, X= 2,90000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 30,0
KCYC= 59 TIMDEL= 9,000000E-02 TIMTOT= 6,790000E-01 TTX= 1,147400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,812070E+09	2,762150E+00
2	9,412080E+06	1,352302E-09	3,975907E+03	8,375683E-01	2,498786E+09	1,689557E+00
3	1,021079E+07	3,824675E-10	1,995656E+04	7,480358E-01	3,523873E+09	6,738835E-01
4	1,114700E+07	9,146976E-11	3,811401E+04	6,210538E-01	9,293464E+09	4,250354E-01
5	1,311413E+07	2,511029E-11	8,821994E+04	4,856040E-01	1,385083E+10	1,738992E-01
6	1,475885E+07	1,085864E-11	1,546519E+05	4,091526E-01	1,985100E+10	1,077775E-01
7	1,632298E+07	4,195358E-12	2,147265E+05	4,017410E-01	3,752624E+10	7,871800E-02
8	1,874123E+07	1,436390E-12	2,626816E+05	5,202220E-01	1,023605E+11	7,351485E-02
9	2,343547E+07	6,247141E-13	4,055476E+05	5,751270E-01	1,398303E+11	4,367697E-02
10	2,795313E+07	3,278686E-13	5,162636E+05	5,028697E-01	1,746607E+11	2,863288E-02
11	3,377741E+07	1,415109E-13	7,006779E+05	5,334345E-01	2,353551E+11	1,665265E-02
12	4,021583E+07	5,373381E-14	9,412033E+05	6,642224E-01	3,430573E+11	9,216687E-03
13	5,062326E+07	1,652675E-14	1,152187E+06	6,920405E-01	6,099600E+11	5,040327E-03
14	6,177403E+07	4,878795E-15	1,357351E+06	7,327458E-01	4,667014E+11	1,138470E-03

TIME STEP IS HALVED, THLF= 2, H= 2,50000E-01 SEC, DELT= 1,14081E+02 CM, X= 1,80000E+01 SEC
TIME STEP IS DOUBLED, THLF= 1, H= 5,00000E-01 SEC, DELT= 1,41777E+00 CM, X= 2,90000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 30,0
KCYC= 101 TIMDEL= 1,460000E-01 TIMTOT= 8,250000E001 TTX= 1,162900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	3,827239E+09	5,833883E+00
2	9,579052E+06	1,015489E-09	2,205564E+04	5,634387E-01	3,754671E+09	1,906414E+00
3	1,061791E+07	2,289437E-10	6,506774E+04	4,341356E-01	7,805972E+09	8,935639E-01
4	1,276054E+07	3,424228E-11	1,342364E+05	3,596612E-01	3,033653E+10	5,193959E-01
5	1,616255E+07	9,441604E-12	3,015822E+05	3,692626E-01	4,475362E+10	2,112730E-01
6	2,197245E+07	4,239644E-12	4,243688E+05	3,411393E-01	6,873116E+10	1,456978E-01
7	2,631364E+07	1,843066E-12	5,751385E+05	3,388663E-01	1,164119E+11	1,072774E-01
8	3,071829E+07	1,120769E-12	7,377093E+05	3,702843E-01	1,453858E+11	8,147196E-02
9	3,455392E+07	7,394591E-13	8,866517E+05	3,999596E-01	1,774264E+11	6,559978E-02
10	3,619132E+07	4,243045E-13	1,058005E+06	4,720588E-01	2,091172E+11	4,436467E-02
11	4,215212E+07	2,094789E-13	1,291417E+06	6,326668E-01	2,396437E+11	2,510016E-02
12	4,657050E+07	1,000087E-13	1,512077E+06	1,068336E+00	2,810437E+11	1,405342E-02
13	5,100310E+07	2,664450E-14	1,919225E+06	1,139717E+00	7,974597E+11	1,062396E-02
14	6,165932E+07	5,106889E-15	1,314966E+06	8,740330E-01	6,143301E+11	1,568658E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 10,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,32E+02	4,32E+02	1,25E+05	1,60E+09	1,01E+05	2,26E+11	5,01E+13	1,34E+13	4,87E+08	1,00E+00	1,00E+00	1,69E+00	191,5	191,5
2	4,66E+02	4,66E+02	1,32E+05	1,24E+09	1,07E+05	3,20E+11	2,65E+13	7,00E+12	5,66E+08	1,00E+00	1,00E+00	9,23E-01	197,8	197,3
3	5,65E+02	5,65E+02	1,64E+05	1,20E+09	1,64E+05	4,27E+11	8,37E+12	2,05E+12	5,69E+08	1,00E+00	1,94E+00	3,32E-01	221,9	220,7
4	6,04E+02	6,04E+02	1,82E+05	7,38E+08	1,81E+05	3,24E+11	2,98E+12	6,43E+11	5,52E+08	1,00E+00	1,58E+01	1,36E-01	252,3	251,4
5	6,40E+02	6,40E+02	1,88E+05	4,08E+08	1,94E+05	1,48E+11	9,75E+11	1,90E+11	3,73E+08	1,00E+00	8,26E+01	5,96E-02	332,1	328,0
6	7,42E+02	7,42E+02	2,03E+05	3,25E+08	1,82E+05	5,66E+10	3,30E+11	6,12E+10	3,12E+08	1,00E+00	2,59E+02	3,03E-02	502,6	485,1
7	7,99E+02	7,99E+02	2,66E+05	2,14E+08	1,00E+00	3,04E+10	1,35E+11	2,26E+10	2,12E+08	1,00E+00	8,66E+02	1,76E-02	669,5	670,9
8	6,93E+02	6,93E+02	3,92E+05	7,07E+07	2,94E+06	1,79E+10	6,22E+10	9,52E+09	7,30E+07	1,00E+00	4,15E+04	1,01E-02	805,2	810,9
9	7,72E+02	7,72E+02	1,63E+06	5,14E+07	1,00E+07	1,02E+10	2,72E+10	3,78E+09	4,27E+07	3,08E+00	1,23E+06	5,75E-03	976,0	994,4
10	9,26E+02	9,26E+02	4,46E+06	3,44E+07	1,35E+07	5,36E+09	1,04E+10	1,29E+09	2,03E+07	1,92E+01	4,21E+06	2,85E-03	1175,1	1187,2
11	1,86E+03	1,86E+03	1,22E+07	7,11E+07	3,02E+07	2,66E+09	3,39E+09	3,28E+08	1,30E+07	5,26E+04	1,13E+07	1,75E-03	1902,4	1888,7
12	2,51E+03	2,51E+03	1,78E+07	3,86E+07	1,40E+07	1,22E+09	9,64E+08	7,09E+07	3,26E+06	5,19E+06	1,00E+07	7,99E-04	2319,9	2285,2
13	4,36E+03	4,36E+03	2,70E+07	2,37E+07	6,68E+06	5,01E+08	2,10E+08	1,17E+07	8,95E+05	1,48E+07	1,17E+07	4,33E-04	3747,8	3682,1
14	5,24E+03	5,24E+03	1,36E+07	5,48E+06	2,05E+06	1,64E+08	3,08E+07	1,65E+06	2,33E+05	5,57E+06	7,97E+06	1,62E-04	5086,4	4954,6

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 10,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,49E+02	4,49E+02	1,31E+05	2,16E+09	1,05E+05	2,28E+11	5,01E+13	1,34E+13	3,57E+08	1,00E+00	1,00E+00	1,70E+00	192,6	192,6
2	5,29E+02	5,29E+02	1,48E+05	2,91E+09	1,13E+05	3,20E+11	2,60E+13	6,89E+12	2,16E+08	1,00E+00	1,00E+00	9,30E-01	203,9	202,0
3	6,53E+02	6,53E+02	1,80E+05	2,63E+09	1,85E+05	4,31E+11	8,35E+12	2,04E+12	2,57E+08	1,00E+00	2,01E+00	3,58E-01	239,8	238,0
4	6,29E+02	6,29E+02	1,88E+05	8,77E+08	1,95E+05	3,30E+11	3,01E+12	6,50E+11	5,68E+08	1,00E+00	1,63E+01	1,47E-01	264,3	264,5
5	7,48E+02	7,48E+02	1,95E+05	6,37E+08	1,99E+05	1,43E+11	9,15E+11	1,76E+11	4,72E+08	1,00E+00	8,85E+01	6,65E-02	399,8	384,9
6	8,95E+02	8,95E+02	2,30E+05	5,14E+08	2,59E+05	5,42E+10	3,02E+11	5,46E+10	4,77E+08	1,00E+00	2,73E+02	3,42E-02	637,9	593,2
7	8,50E+02	8,50E+02	2,93E+05	2,69E+08	2,06E+04	3,17E+10	1,36E+11	2,22E+10	2,71E+08	1,00E+00	9,48E+02	2,08E-02	801,6	781,2
8	8,20E+02	8,20E+02	5,99E+05	1,33E+08	5,05E+06	1,91E+10	6,42E+10	9,54E+09	1,26E+08	1,12E+00	1,02E+05	1,24E-02	933,6	952,8
9	9,54E+02	9,54E+02	2,91E+06	9,78E+07	1,87E+07	1,09E+10	2,82E+10	3,77E+09	7,11E+07	6,07E+00	2,34E+06	7,06E-03	1122,6	1162,6
10	1,19E+03	1,19E+03	8,79E+06	7,86E+07	2,85E+07	5,84E+09	1,11E+10	1,32E+09	3,29E+07	4,32E+01	8,41E+06	3,68E-03	1358,3	1413,2
11	3,42E+03	3,42E+03	1,96E+07	2,18E+08	5,65E+07	2,84E+09	3,17E+09	1,97E+08	2,58E+07	1,04E+06	1,54E+07	3,14E-03	3320,0	3255,1
12	4,81E+03	4,81E+03	4,46E+07	1,14E+08	2,17E+07	1,17E+09	8,06E+08	3,03E+07	3,33E+06	2,61E+07	1,71E+07	1,37E-03	4279,7	4023,5
13	6,91E+03	6,91E+03	6,10E+07	5,78E+07	1,22E+07	4,71E+08	1,67E+08	6,93E+06	2,13E+06	3,70E+07	2,35E+07	8,07E-04	7068,5	6793,8
14	7,10E+03	7,10E+03	2,23E+07	9,26E+06	3,20E+06	1,50E+08	2,45E+07	1,19E+06	4,48E+05	9,14E+06	1,31E+07	2,53E-04	8163,4	7774,1

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 10,00 TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,18E+02	5,18E+02	1,51E+05	7,72E+09	1,21E+05	2,37E+11	5,01E+13	1,34E+13	8,78E+06	1,00E+00	1,00E+00	1,75E+00	198,9	198,9
2	6,35E+02	6,35E+02	1,76E+05	1,20E+10	1,37E+05	3,27E+11	2,57E+13	6,79E+12	6,43E+05	1,00E+00	1,00E+00	9,81E-01	219,6	216,3
3	7,56E+02	7,56E+02	2,06E+05	6,61E+09	1,95E+05	4,33E+11	8,25E+12	2,01E+12	1,22E+07	1,00E+00	2,13E+00	3,92E-01	268,4	264,7
4	7,60E+02	7,60E+02	2,01E+05	1,61E+09	1,88E+05	3,19E+11	2,83E+12	6,05E+11	2,96E+08	1,00E+00	1,78E+01	1,69E-01	330,1	321,1
5	9,47E+02	9,47E+02	2,19E+05	1,02E+09	1,48E+05	1,32E+11	7,90E+11	1,48E+11	6,34E+08	1,00E+00	9,68E+01	8,08E-02	587,5	532,1
6	1,06E+03	1,06E+03	2,59E+05	4,38E+08	5,35E+05	5,52E+10	2,80E+11	4,81E+10	8,34E+08	1,00E+00	3,01E+02	4,41E-02	897,4	807,3
7	9,17E+02	9,17E+02	3,42E+05	2,95E+08	4,26E+05	3,55E+10	1,43E+11	2,21E+10	4,06E+08	1,00E+00	1,15E+03	2,86E-02	1023,6	1015,0
8	1,12E+03	1,12E+03	9,80E+05	2,74E+08	9,61E+06	2,17E+10	6,76E+10	9,23E+09	3,00E+08	2,88E+00	1,80E+05	1,89E-02	1285,7	1345,6
9	1,41E+03	1,41E+03	4,98E+06	2,87E+08	4,38E+07	1,32E+10	3,19E+10	3,82E+09	1,91E+08	1,92E+01	3,80E+06	1,22E-02	1551,1	1707,8
10	2,17E+03	2,17E+03	1,59E+07	3,34E+08	8,60E+07	8,02E+09	1,38E+10	1,30E+09	1,20E+08	1,89E+02	1,42E+07	8,80E-03	2244,8	2571,6
11	7,77E+03	7,77E+03	4,68E+07	1,60E+09	2,18E+08	3,13E+09	2,34E+09	1,00E+00	1,22E+08	3,61E+07	5,56E+06	8,24E-03	7663,2	7490,9
12	9,03E+03	9,03E+03	9,67E+07	4,79E+06	9,32E+07	8,64E+08	3,36E+08	1,00E+00	2,26E+07	7,52E+07	1,85E+07	2,44E-03	10361,0	8522,2
13	1,11E+04	1,11E+04	1,18E+08	1,46E+08	4,85E+07	4,15E+08	7,36E+07	5,13E+05	9,28E+06	7,09E+07	4,58E+07	1,68E-03	14111,1	13068,5
14	1,06E+04	1,06E+04	3,87E+07	1,56E+07	5,63E+06	1,40E+08	1,63E+07	7,01E+05	1,17E+06	1,57E+07	2,28E+07	4,47E-04	13533,6	12816,3

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4   TDAT1 = 10,00   TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6,49E+02	6,49E+02	1,92E+05	3,95E+10	1,57E+05	2,62E+11	5,00E+13	1,34E+13	6,83E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	8,40E+02	8,40E+02	2,30E+05	5,38E+10	1,72E+05	3,52E+11	2,52E+13	6,65E+12	5,53E+06	1,00E+00	1,00E+00	1,17E+00	269,7	263,3
3	9,05E+02	9,05E+02	2,37E+05	1,66E+10	2,00E+05	4,33E+11	7,92E+12	1,93E+12	1,52E+07	1,00E+00	2,25E+00	4,51E-01	327,8	316,2
4	1,06E+03	1,06E+03	2,27E+05	3,01E+09	5,07E+04	2,86E+11	2,22E+12	4,59E+11	4,91E+08	1,00E+00	2,05E+01	2,19E-01	586,8	518,5
5	1,41E+03	1,41E+03	2,68E+05	1,01E+00	1,00E+00	1,26E+11	6,04E+11	9,91E+10	5,25E+09	1,00E+00	1,11E+02	1,16E-01	1223,5	1005,2
6	1,14E+03	1,14E+03	3,69E+05	2,24E+07	9,89E+05	8,19E+10	3,46E+11	5,21E+10	2,31E+09	1,00E+00	4,65E+02	9,64E-02	1436,9	1429,9
7	1,41E+03	1,41E+03	1,70E+06	1,94E+08	6,55E+06	6,27E+10	2,05E+11	2,53E+10	1,84E+09	1,16E+00	1,41E+03	9,24E-02	1933,3	2222,2
8	2,15E+03	2,15E+03	4,93E+06	2,63E+08	1,51E+07	3,63E+10	8,81E+10	7,61E+09	1,58E+09	9,85E+00	6,19E+03	6,08E-02	2776,8	3130,3
9	6,62E+03	6,62E+03	1,77E+07	3,89E+09	2,08E+08	1,62E+10	2,12E+10	1,00E+00	5,09E+08	1,60E+02	1,92E+03	4,20E-02	7487,3	7163,6
10	8,29E+03	8,29E+03	1,45E+07	5,02E+09	2,34E+08	4,96E+09	4,23E+09	1,00E+00	5,75E+08	1,68E+04	1,29E+04	1,70E-02	9368,3	7811,4
11	1,14E+04	1,14E+04	1,10E+09	2,55E+09	1,12E+09	1,72E+09	1,00E+00	1,00E+00	4,11E+06	8,53E+08	1,85E+08	1,42E-02	17246,5	13836,8
12	1,56E+04	1,56E+04	5,05E+08	3,38E+08	2,52E+08	4,65E+08	1,00E+00	1,00E+00	1,67E+06	3,46E+08	1,43E+08	4,67E-03	22959,6	16077,0
13	2,24E+04	2,24E+04	2,81E+08	1,17E+08	9,78E+07	2,99E+08	5,81E+06	1,00E+00	3,09E+06	1,56E+08	1,22E+08	3,71E-03	29999,7	26414,6
14	1,82E+04	1,82E+04	7,50E+07	1,91E+07	1,18E+07	1,31E+08	7,74E+06	2,54E+05	1,52E+06	2,91E+07	4,57E+07	9,54E-04	23238,3	22337,6

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5   TDAT1 = 10,00   TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	9,19E+02	9,19E+02	2,74E+05	1,66E+11	2,23E+05	3,99E+11	5,00E+13	1,33E+13	7,27E+07	1,00E+00	1,00E+00	2,79E+00	313,1	313,1
2	1,19E+03	1,19E+03	2,87E+05	2,24E+10	1,48E+05	5,47E+11	2,22E+13	5,73E+12	1,09E+09	1,00E+00	1,00E+00	1,83E+00	469,1	429,3
3	1,28E+03	1,28E+03	2,66E+05	7,77E+02	1,35E+05	4,79E+11	6,28E+12	1,46E+12	3,53E+09	1,00E+00	3,17E+00	6,92E-01	686,5	593,6
4	1,95E+03	1,95E+03	9,01E+05	1,01E+00	1,00E+00	3,28E+11	1,49E+12	2,30E+11	4,74E+10	1,00E+00	2,81E+01	4,25E-01	1879,1	1480,8
5	2,07E+03	2,07E+03	1,31E+06	1,02E+00	1,00E+00	1,37E+11	4,07E+11	3,81E+10	2,49E+10	1,00E+00	1,23E+02	1,74E-01	3041,7	2119,6
6	2,42E+03	2,42E+03	1,23E+06	1,03E+00	1,00E+00	7,06E+10	1,76E+11	1,04E+10	1,11E+10	1,00E+00	2,67E+02	1,08E-01	4675,6	2990,8
7	5,98E+03	5,96E+03	1,60E+07	7,74E+09	4,45E+06	3,83E+10	6,23E+10	1,00E+00	5,57E+09	2,85E+00	1,23E+02	7,52E-02	8083,2	5123,4
8	7,77E+03	7,77E+03	2,54E+09	3,73E+10	1,02E+10	1,07E+10	1,75E+07	1,00E+00	1,01E+00	1,76E+09	6,78E+08	7,47E-02	11615,3	8377,7
9	8,76E+03	8,76E+03	1,27E+10	8,58E+09	1,72E+09	3,20E+09	3,06E+02	1,00E+00	1,00E+00	9,50E+09	3,23E+09	4,44E-02	10351,7	7850,5
10	9,91E+03	9,91E+03	8,42E+09	2,73E+09	8,81E+08	1,73E+09	1,00E+00	1,00E+00	1,00E+00	6,19E+09	2,22E+09	2,89E-02	13085,4	9274,3
11	1,27E+04	1,27E+04	4,64E+09	4,55E+08	2,16E+08	5,01E+08	3,54E+00	1,00E+00	1,00E+00	3,25E+09	1,39E+09	1,67E-02	15883,8	11601,0
12	1,82E+04	1,82E+04	1,77E+09	1,10E+08	8,16E+07	2,25E+08	1,00E+00	1,00E+00	2,57E+01	1,10E+09	6,63E+08	9,22E-03	20618,1	16803,7
13	2,30E+04	2,30E+04	4,60E+08	3,76E+07	3,15E+07	1,31E+08	1,17E+04	1,00E+00	4,64E+04	2,39E+08	2,20E+08	5,04E-03	50538,9	42042,8
14	2,30E+04	2,30E+04	8,88E+07	1,14E+07	9,29E+06	7,65E+07	1,57E+06	3,85E+04	5,05E+05	3,26E+07	5,59E+07	1,14E-03	40429,6	34608,0

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6   TDAT1 = 10,00   TDAT2 = 30,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,22E+03	1,22E+03	3,60E+05	1,39E+05	2,90E+05	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	1,52E+03	1,52E+03	2,52E+05	8,85E+04	1,00E+00	6,50E+11	1,67E+13	4,18E+12	3,42E+10	1,00E+00	1,00E+00	1,91E+00	855,0	641,7
3	2,00E+03	2,00E+03	3,14E+05	2,43E+04	1,37E+06	5,62E+11	3,74E+12	7,07E+11	1,31E+11	1,00E+00	4,38E+00	8,94E-01	1939,2	1277,7
4	3,43E+03	3,43E+03	3,29E+07	1,71E+00	1,00E+00	5,49E+11	7,37E+11	1,00E+00	9,93E+05	1,00E+00	1,81E+01	1,02E+00	6352,8	3809,9
5	4,90E+03	4,90E+03	7,18E+07	2,70E+10	9,06E+07	1,82E+11	1,61E+11	1,00E+00	4,76E+09	1,13E+01	5,13E+01	3,26E-01	7310,7	4442,5
6	9,62E+03	9,62E+03	2,36E+09	1,11E+11	3,09E+10	3,54E+10	2,62E+06	1,00E+00	1,25E+00	3,85E+08	1,74E+09	1,52E-01	9900,4	5782,5
7	6,88E+03	6,88E+03	2,53E+10	3,86E+10	7,08E+09	7,92E+09	6,66E+00	1,00E+00	1,00E+00	1,58E+10	9,40E+09	1,10E-01	12318,1	7170,6
8	7,87E+03	7,87E+03	2,52E+10	1,43E+10	3,28E+09	3,91E+09	1,00E+00	1,00E+00	1,00E+00	1,84E+10	6,77E+09	8,28E-02	13004,5	7913,4
9	9,25E+03	9,25E+03	2,14E+10	5,58E+09	1,66E+09	2,10E+09	1,00E+00	1,00E+00	1,00E+00	1,59E+10	5,46E+09	6,61E-02	14309,9	9049,9
10	1,07E+04	1,07E+04	1,48E+10	1,51E+09	4,92E+08	7,19E+08	1,00E+00	1,00E+00	1,00E+00	1,07E+10	4,12E+09	4,44E-02	14968,4	10284,2
11	1,18E+04	1,18E+04	8,02E+09	2,72E+08	8,79E+07	2,25E+08	1,00E+00	1,00E+00	1,00E+00	5,45E+09	2,58E+09	2,51E-02	14405,0	11457,8
12	1,23E+04	1,23E+04	3,97E+09	3,59E+07	1,05E+07	4,22E+07	1,00E+00	1,00E+00	1,00E+00	2,36E+09	1,61E+09	1,41E-02	12426,6	12844,2
13	2,30E+04	2,30E+04	9,55E+08	2,09E+07	1,76E+07	7,05E+07	1,00E+00	1,00E+00	2,43E+01	4,58E+08	4,97E+08	1,06E-02	47077,1	50258,4
14	2,30E+04	2,30E+04	1,11E+08	9,92E+06	8,20E+06	6,76E+07	7,54E+05	1,52E+04	2,08E+05	3,98E+07	7,15E+07	1,57E-03	48463,7	45308,6

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        OUTPUT FROM RKAM2G FOR COLUMN ( 1,  1) AND TIME =   60,0
KCYC=   39 TIMDEL= 3,800000E-02 TIMTOT= 8,630000E-01 TTX= 1,161800E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,106560E+09   1,666736E+00
 2   9,351214E+06   1,593015E-09   1,282065E+02   9,875862E-01   1,137523E+09   9,060459E-01
 3   1,002065E+07   4,937412E-10   4,547705E+02   9,681664E-01   1,282529E+09   3,166188E-01
 4   1,068195E+07   1,713045E-10   1,569098E+03   9,446791E-01   1,477643E+09   1,265635E-01
 5   1,142626E+07   5,509642E-11   3,794061E+03   9,277942E-01   1,940669E+09   5,346197E-02
 6   1,231227E+07   1,814527E-11   5,845312E+03   9,009476E-01   2,851404E+09   2,586974E-02
 7   1,337960E+07   7,421426E-12   8,464407E+03   8,926845E-01   4,005555E+09   1,486346E-02
 8   1,460367E+07   3,689510E-12   1,235763E+04   9,512843E-01   5,094399E+09   9,397916E-03
 9   1,597653E+07   1,824973E-12   1,641396E+04   1,047062E+00   6,749345E+09   6,158685E-03
10   1,783187E+07   7,517976E-13   1,197294E+04   1,076006E+00   8,453909E+09   3,177814E-03
11   2,075160E+07   2,418581E-13   5,359149E+03   9,713988E-01   1,388178E+10   1,678711E-03
12   2,588595E+07   7,453183E-14   2,486878E+04   8,982695E-01   1,825967E+10   6,804635E-04
13   3,260894E+07   2,233899E-14   4,899037E+04   8,885226E-01   3,247471E+10   3,627260E-04
14   4,294311E+07   5,489299E-15   1,039414E+05   8,549924E-01   4,679145E+10   1,284261E-04
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    5,40533E-02 CM, X=    3,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=    4,44503E-01 CM, X=    3,40000E+01 SEC

        OUTPUT FROM RKAM2G FOR COLUMN ( 2,  1) AND TIME =   60,0
KCYC=   47 TIMDEL= 4,800000E-02 TIMTOT= 9,110000E-01 TTX= 1,187400E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,113330E+09   1,697056E+00
 2   9,354310E+06   1,527975E-09   3,310564E+02   9,631000E-01   1,150476E+09   8,789496E-01
 3   1,007711E+07   4,738372E-10   1,317221E+03   9,318519E-01   1,359227E+09   3,220262E-01
 4   1,074485E+07   1,674969E-10   4,256186E+03   9,127420E-01   1,530078E+09   1,261416E-01
 5   1,152412E+07   4,931914E-11   7,827608E+03   8,851815E-01   2,246256E+09   5,539172E-02
 6   1,259335E+07   1,552118E-11   1,082126E+04   8,438044E-01   3,420467E+09   2,654485E-02
 7   1,378837E+07   7,105874E-12   1,600903E+04   8,495934E-01   4,574079E+09   1,625141E-02
 8   1,499654E+07   3,834229E-12   2,200757E+04   9,564358E-01   6,056206E+09   1,161044E-02
 9   1,630575E+07   2,076013E-12   2,557960E+04   1,148716E+00   8,370587E+09   8,688725E-03
10   1,782242E+07   9,174306E-13   1,747969E+04   1,227284E+00   1,090602E+10   5,002756E-03
11   2,020788E+07   2,308308E-13   8,135265E+03   9,558764E-01   2,542726E+10   2,934697E-03
12   2,764924E+07   5,531553E-14   7,484818E+04   7,426915E-01   3,169899E+10   8,767233E-04
13   3,559678E+07   1,911884E-14   1,372486E+05   8,006033E-01   6,050822E+10   5,784236E-04
14   4,751098E+07   4,744752E-15   2,399157E+05   7,796856E-01   7,340217E+10   1,741375E-04
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    1,71359E-01 CM, X=    3,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=    1,34159E+00 CM, X=    3,40000E+01 SEC

        OUTPUT FROM RKAM2G FOR COLUMN ( 3,  1) AND TIME =   60,0
KCYC=   56 TIMDEL= 4,700000E-02 TIMTOT= 9,580000E-01 TTX= 1,193000E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,148948E+09   1,751348E+00
 2   9,368555E+06   1,453236E-09   6,581001E+02   9,279980E-01   1,207349E+09   8,772812E-01
 3   1,013885E+07   4,364320E-10   3,442225E+03   8,688168E-01   1,456314E+09   3,177911E-01
 4   1,087765E+07   1,416370E-10   8,595971E+03   8,223877E-01   1,777114E+09   1,258526E-01
 5   1,186303E+07   3,799828E-11   1,484909E+04   7,888401E-01   2,978030E+09   5,658001E-02
 6   1,328194E+07   1,317611E-11   2,296471E+04   7,716748E-01   4,542421E+09   2,992573E-02
 7   1,452371E+07   7,644935E-12   2,826580E+04   8,709076E-01   6,070621E+09   2,320475E-02
 8   1,554482E+07   4,597799E-12   2,611507E+04   1,085805E+00   9,312102E+09   2,140759E-02
 9   1,662155E+07   2,543350E-12   3,697561E+04   1,237313E+00   1,317202E+10   1,675052E-02
10   1,784232E+07   1,145992E-12   5,197596E+04   1,220178E+00   2,070995E+10   1,186672E-02
11   1,973537E+07   2,087788E-13   5,533550E+04   8,848611E-01   6,613897E+10   6,904207E-03
12   3,363726E+07   3,137511E-14   2,252364E+05   5,812421E-01   6,899942E+10   1,082432E-03
13   4,491859E+07   1,466982E-14   3,663106E+05   6,638707E-01   1,240342E+11   9,097796E-04
14   5,837340E+07   4,082973E-15   5,520441E+05   6,753124E-01   1,215690E+11   2,481815E-04
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    1,86555E+00 CM, X=    3,40000E+01 SEC
```

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 60,0
KCYC= 94 TIMDEL= 7,900000E-02 TIMTOT= 1,037000E+00 TTX= 1,201800E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,261864E+09	1,923467E+00
2	9,420889E+06	1,293839E-09	2,104245E+03	8,420550E-01	1,401991E+09	9,069758E-01
3	1,027455E+07	3,684574E-10	8,935008E+03	7,627625E-01	1,630194E+09	3,003285E-01
4	1,121062E+07	1,013498E-10	1,581567E+04	7,475678E-01	2,788076E+09	1,412855E-01
5	1,273140E+07	2,912163E-11	2,354980E+04	7,897676E-01	5,610201E+09	8,168910E-02
6	1,430129E+07	1,186698E-11	5,342253E+04	5,612292E-01	6,834127E+09	4,055023E-02
7	1,572507E+07	5,445222E-12	7,875799E+04	4,298478E-01	9,560922E+09	2,603067E-02
8	1,734592E+07	2,827286E-12	1,023952E+05	5,078643E-01	1,555909E+10	2,199501E-02
9	1,892584E+07	1,141355E-12	8,458887E+04	7,532084E-01	4,809137E+10	2,744467E-02
10	2,463805E+07	2,970488E-13	2,576751E+05	6,522103E-01	6,014410E+10	8,932866E-03
11	3,010681E+07	9,385508E-14	2,798491E+05	6,170341E-01	1,470818E+11	6,902216E-03
12	5,167291E+07	1,810194E-14	6,166276E+05	4,801443E-01	1,718394E+11	1,555314E-03
13	7,154169E+07	9,661531E-15	1,017727E+06	4,834508E-01	2,578426E+11	1,245577E-03
14	8,722391E+07	3,229550E-15	1,317593E+06	4,919733E-01	2,038113E+11	3,291094E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 1,86816E+00 CM, X= 3,20000E+01 SEC
FOR COLUMN 5 REZONE NUMBER 1 REQUIRED AT TIME 6,000000E+01

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 60,0
KCYC= 91 TIMDEL= 7,700000E-02 TIMTOT= 1,114000E+00 TTX= 1,210400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,829256E+09	2,788347E+00
2	9,667383E+06	8,208017E-10	8,745337E+03	6,069663E-01	2,112305E+09	8,668917E-01
3	1,101462E+07	2,275187E-10	2,887643E+04	5,948707E-01	2,791805E+09	3,175940E-01
4	1,255887E+07	5,285225E-11	5,187652E+04	5,778112E-01	7,064847E+09	1,866965E-01
5	1,629521E+07	1,235067E-11	1,146904E+05	4,918567E-01	9,717885E+09	6,001118E-02
6	1,968245E+07	5,323250E-12	1,649977E+05	4,902317E-01	1,395238E+10	3,713601E-02
7	2,268961E+07	2,288718E-12	2,037750E+05	5,455357E-01	2,649335E+10	3,031790E-02
8	2,669725E+07	7,680615E-13	2,763725E+05	5,347164E-01	7,606514E+10	2,921135E-02
9	3,749239E+07	2,780204E-13	5,061190E+05	4,450362E-01	9,489195E+10	1,319095E-02
10	4,595898E+07	1,610296E-13	6,539695E+05	4,911406E-01	1,234711E+11	9,941249E-03
11	5,810517E+07	6,244443E-14	8,864471E+05	4,412696E-01	1,566440E+11	4,890771E-03
12	7,158042E+07	2,331324E-14	1,119888E+06	4,338655E-01	2,260775E+11	2,635300E-03
13	9,338230E+07	7,634166E-15	1,596801E+06	4,619280E-01	4,148060E+11	1,583349E-03
14	1,128433E+08	2,427692E-15	1,957018E+06	4,976007E-01	3,295082E+11	3,999722E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 1,98613E+00 CM, X= 5,40000E+01 SEC
FOR COLUMN 6 REZONE NUMBER 1 REQUIRED AT TIME 6,000000E+01

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 60,0
KCYC= 155 TIMDEL= 1,240000E-01 TIMTOT= 1,238000E+00 TTX= 1,223600E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL,,CM/SEC	DEN, RATIO	INT, E,,ERG/G	PRESS,,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	3,827241E+09	5,833887E+00
2	1,047996E+07	4,727058E-10	2,734277E+04	4,654955E-01	2,561714E+09	6,054686E-01
3	1,219316E+07	1,641087E-10	3,385141E+04	7,168082E-01	6,608939E+09	5,422921E-01
4	1,498013E+07	2,122081E-11	6,302019E+04	6,197253E-01	4,674310E+10	4,959632E-01
5	2,891154E+07	4,035716E-12	3,830842E+05	4,274397E-01	4,511681E+10	9,103932E-02
6	3,594906E+07	2,180334E-12	4,904372E+05	5,142728E-01	5,137891E+10	5,601158E-02
7	4,452675E+07	8,476481E-13	6,332448E+05	4,599119E-01	8,131085E+10	3,446149E-02
8	5,407263E+07	4,543035E-13	8,110364E+05	4,053499E-01	9,402665E+10	2,135832E-02
9	6,345777E+07	2,601688E-13	1,014155E+06	3,518367E-01	1,060040E+11	1,378947E-02
10	7,345324E+07	1,357257E-13	1,239697E+06	3,198781E-01	1,184782E+11	8,040268E-03
11	8,462074E+07	6,881377E-14	1,477206E+06	3,284997E-01	1,374002E+11	4,727514E-03
12	9,565311E+07	3,778432E-14	1,678517E+06	3,778102E-01	1,727528E+11	3,263674E-03
13	1,051346E+08	1,059493E-14	1,866547E+06	3,976402E-01	5,028960E+11	2,664073E-03
14	1,286357E+08	1,928278E-15	2,789347E+06	3,775836E-01	3,776299E+11	3,640876E-04

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,08E+02	4,08E+02	6,13E+04	1,28E+09	2,71E+04	2,26E+11	5,01E+13	1,34E+13	1,67E+08	1,00E+00	1,00E+00	1,69E+00	191,7	191,7
2	4,51E+02	4,51E+02	6,45E+04	9,14E+08	3,14E+04	3,16E+11	2,62E+13	6,92E+12	2,54E+08	1,00E+00	1,00E+00	9,07E-01	197,7	196,5
3	5,58E+02	5,58E+02	1,59E+05	8,53E+08	6,70E+04	4,14E+11	8,11E+12	1,99E+12	2,64E+08	1,00E+00	1,92E+00	3,17E-01	221,7	218,2
4	6,02E+02	6,02E+02	1,73E+05	4,54E+08	7,40E+04	3,06E+11	2,81E+12	6,08E+11	3,09E+08	1,00E+00	1,54E+01	1,27E-01	253,0	245,9
5	6,39E+02	6,39E+02	1,78E+05	2,77E+08	7,16E+04	1,37E+11	9,05E+11	1,76E+11	2,72E+08	1,00E+00	8,00E+01	5,37E-02	329,9	317,7
6	7,42E+02	7,42E+02	1,65E+05	2,19E+08	6,05E+04	5,11E+10	2,98E+11	5,51E+10	2,47E+08	1,00E+00	2,52E+02	2,61E-02	488,2	463,4
7	7,99E+02	7,99E+02	1,57E+05	1,50E+08	1,47E+05	2,72E+10	1,21E+11	2,02E+10	1,87E+08	1,00E+00	8,17E+02	1,50E-02	676,4	639,1
8	6,93E+02	6,93E+02	1,73E+05	6,03E+07	1,65E+05	1,71E+10	5,91E+10	9,05E+09	7,50E+07	1,00E+00	3,13E+03	9,42E-03	817,2	797,0
9	7,72E+02	7,72E+02	3,92E+05	4,99E+07	2,77E+06	1,07E+10	2,85E+10	3,95E+09	5,11E+07	2,54E+00	1,35E+05	6,20E-03	1006,4	1029,8
10	9,29E+02	9,29E+02	2,16E+06	3,74E+07	8,75E+06	5,76E+09	1,12E+10	1,38E+09	2,67E+07	1,85E+01	1,90E+06	3,21E-03	1200,8	1245,6
11	1,90E+03	1,90E+03	7,48E+06	7,34E+07	2,30E+07	2,60E+09	3,29E+09	3,11E+08	1,88E+07	5,51E+02	7,08E+06	1,71E-03	1947,1	1919,1
12	2,61E+03	2,61E+03	9,75E+06	4,04E+07	1,28E+07	1,11E+09	8,64E+08	5,93E+07	3,90E+06	1,22E+06	7,53E+06	7,08E-04	2458,1	2329,7
13	4,45E+03	4,45E+03	2,06E+07	2,55E+07	5,47E+06	4,51E+08	1,86E+08	8,20E+06	7,87E+05	1,08E+07	9,54E+06	3,79E-04	3847,3	3626,6
14	4,90E+03	4,90E+03	1,13E+07	5,26E+06	1,61E+06	1,41E+08	2,62E+07	1,27E+06	2,13E+05	4,59E+06	6,71E+06	1,30E-04	5019,3	4641,2

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,23E+02	4,23E+02	6,38E+04	1,88E+09	2,82E+04	2,28E+11	5,01E+13	1,34E+13	7,84E+07	1,00E+00	1,00E+00	1,70E+00	192,9	192,9
2	5,10E+02	5,10E+02	7,10E+04	2,61E+09	3,18E+04	3,09E+11	2,51E+13	6,63E+12	2,58E+07	1,00E+00	1,00E+00	8,79E-01	202,5	198,7
3	6,45E+02	6,45E+02	1,64E+05	2,23E+09	6,13E+04	4,02E+11	7,78E+12	1,90E+12	3,33E+07	1,00E+00	1,95E+00	3,23E-01	239,5	231,2
4	6,27E+02	6,27E+02	1,72E+05	5,21E+08	6,83E+04	3,01E+11	2,75E+12	5,93E+11	2,88E+08	1,00E+00	1,55E+01	1,29E-01	266,4	254,5
5	7,47E+02	7,47E+02	1,76E+05	3,78E+08	5,79E+04	1,26E+11	8,10E+11	1,56E+11	2,93E+08	1,00E+00	8,56E+01	5,59E-02	390,2	367,2
6	8,94E+02	8,94E+02	1,59E+05	2,86E+08	4,58E+04	4,59E+10	2,55E+11	4,61E+10	3,62E+08	1,00E+00	2,65E+02	2,69E-02	603,0	553,9
7	8,50E+02	8,50E+02	1,53E+05	1,66E+08	1,11E+05	2,70E+10	1,16E+11	1,88E+10	2,44E+08	1,00E+00	8,52E+02	1,64E-02	789,4	727,6
8	8,19E+02	8,19E+02	1,97E+05	1,02E+08	1,91E+05	1,83E+10	6,14E+10	9,11E+09	1,30E+08	1,00E+00	3,61E+03	1,17E-02	965,7	944,5
9	9,54E+02	9,54E+02	6,04E+05	9,58E+07	5,22E+06	1,25E+10	3,24E+10	4,31E+09	9,14E+07	5,00E+00	2,10E+05	8,78E-03	1187,2	1272,4
10	1,20E+03	1,20E+03	3,79E+06	9,35E+07	1,89E+07	7,21E+09	1,37E+10	1,60E+09	5,18E+07	4,29E+01	3,35E+06	5,10E-03	1443,7	1599,4
11	3,51E+03	3,51E+03	6,64E+06	2,05E+08	4,30E+07	2,76E+09	3,03E+09	1,62E+08	4,14E+07	1,42E+04	5,58E+06	3,03E-03	3470,4	3393,0
12	5,01E+03	5,01E+03	2,06E+07	1,01E+08	1,55E+07	8,91E+08	5,94E+08	1,47E+07	3,34E+06	1,18E+07	8,40E+06	9,33E-04	4426,6	3814,8
13	6,68E+03	6,68E+03	4,16E+07	5,86E+07	9,63E+06	3,88E+08	1,30E+08	2,78E+06	1,24E+06	2,53E+07	1,60E+07	6,07E-04	6947,2	6216,1
14	6,52E+03	6,52E+03	1,69E+07	8,48E+06	2,24E+06	1,18E+08	1,87E+07	7,79E+05	4,99E+05	6,88E+06	9,97E+06	1,75E-04	7847,3	6929,1

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,84E+02	4,84E+02	7,38E+04	7,71E+09	3,25E+04	2,37E+11	5,01E+13	1,34E+13	1,86E+05	1,00E+00	1,00E+00	1,75E+00	199,0	199,0
2	6,10E+02	6,10E+02	8,18E+04	1,11E+10	3,23E+04	3,04E+11	2,39E+13	6,30E+12	2,31E+05	1,00E+00	1,00E+00	8,77E-01	216,4	208,4
3	7,45E+02	7,45E+02	1,62E+05	5,72E+09	5,38E+04	3,76E+11	7,16E+12	1,75E+12	1,12E+06	1,00E+00	1,98E+00	3,18E-01	265,6	247,5
4	7,57E+02	7,57E+02	1,62E+05	1,11E+09	4,78E+04	2,63E+11	2,33E+12	4,98E+11	9,29E+07	1,00E+00	1,63E+01	1,26E-01	325,5	295,2
5	9,46E+02	9,46E+02	1,57E+05	4,83E+08	4,46E+04	1,05E+11	6,24E+11	1,16E+11	3,84E+08	1,00E+00	9,29E+01	5,74E-02	545,5	484,5
6	1,06E+03	1,06E+03	1,45E+05	1,18E+08	1,00E+00	4,28E+10	2,16E+11	3,71E+10	7,21E+08	1,00E+00	2,91E+02	3,04E-02	831,8	730,7
7	9,17E+02	9,17E+02	1,69E+05	1,30E+08	7,35E+04	3,11E+10	1,24E+11	1,92E+10	3,98E+08	1,00E+00	9,96E+02	2,34E-02	1028,9	960,2
8	1,12E+03	1,12E+03	3,58E+05	1,47E+08	7,33E+05	2,37E+10	7,35E+10	9,91E+09	3,51E+08	1,75E+00	3,96E+03	2,17E-02	1382,1	1440,1
9	1,42E+03	1,42E+03	1,03E+06	1,97E+08	8,98E+06	1,66E+10	3,95E+10	4,57E+09	2,92E+08	1,39E+01	1,28E+05	1,72E-02	1781,8	1982,0
10	2,18E+03	2,18E+03	3,37E+06	2,63E+08	3,48E+07	1,01E+10	1,69E+10	1,40E+09	2,38E+08	1,48E+02	1,53E+06	1,24E-02	2693,6	2975,4
11	7,68E+03	7,68E+03	6,25E+06	1,68E+09	1,51E+08	2,70E+09	1,95E+09	1,00E+00	1,92E+08	7,50E+05	2,50E+05	6,92E-03	8005,8	7530,9
12	7,83E+03	7,83E+03	3,80E+07	3,30E+08	6,15E+07	5,14E+08	1,85E+08	1,00E+00	9,84E+06	3,08E+07	6,32E+06	1,14E-03	8878,6	6769,0
13	9,91E+03	9,91E+03	6,69E+07	1,32E+08	3,45E+07	2,81E+08	3,85E+07	3,17E+03	5,65E+06	3,99E+07	2,64E+07	9,37E-04	13382,3	10903,7
14	9,19E+03	9,19E+03	2,52E+07	1,30E+07	3,87E+06	9,50E+07	1,00E+07	3,40E+05	1,25E+06	1,02E+07	1,49E+07	2,50E-04	12892,6	10594,8

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,99E+02	5,99E+02	9,29E+04	3,94E+10	4,08E+04	2,62E+11	5,00E+13	1,34E+13	6,59E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	8,02E+02	8,02E+02	9,75E+04	4,51E+10	2,78E+04	2,97E+11	2,12E+13	5,60E+12	2,77E+06	1,00E+00	1,00E+00	9,07E-01	263,5	241,8
3	8,93E+02	8,93E+02	1,46E+05	1,25E+10	3,90E+04	3,30E+11	6,04E+12	1,47E+12	6,36E+06	1,00E+00	1,98E+00	3,01E-01	316,9	276,7
4	1,05E+03	1,05E+03	1,43E+05	1,45E+09	5,48E+04	2,15E+11	1,66E+12	3,43E+11	2,18E+08	1,00E+00	1,96E+01	1,43E-01	532,3	460,2
5	1,41E+03	1,41E+03	1,58E+05	6,42E+04	1,09E+05	9,97E+10	4,77E+11	7,83E+10	5,25E+09	1,00E+00	1,17E+02	8,17E-02	1009,8	897,4
6	1,14E+03	1,14E+03	1,18E+05	1,00E+00	1,00E+00	4,60E+10	1,94E+11	2,92E+10	2,30E+09	1,00E+00	3,33E+02	4,06E-02	1448,3	1085,0
7	1,41E+03	1,41E+03	1,82E+05	1,01E+00	1,00E+00	2,71E+10	6,82E+10	1,08E+10	1,87E+09	1,00E+00	7,27E+02	2,63E-02	2267,0	1486,3
8	2,15E+03	2,15E+03	5,15E+05	1,03E+00	1,00E+00	1,86E+10	4,48E+10	3,74E+09	1,61E+09	1,11E+00	1,76E+03	2,24E-02	3287,1	2342,6
9	6,61E+03	6,61E+03	8,78E+06	2,72E+09	8,50E+07	1,25E+10	1,62E+10	1,00E+00	2,21E+08	1,75E+02	1,57E+03	2,83E-02	7225,7	6271,1
10	8,22E+03	8,22E+03	5,35E+06	3,02E+09	7,22E+07	3,58E+09	3,10E+09	1,00E+00	2,39E+08	3,72E+03	4,04E+03	9,97E-03	8159,0	6589,1
11	1,17E+04	1,17E+04	6,38E+08	1,70E+09	6,28E+08	1,06E+09	7,52E+05	1,00E+00	1,00E+00	5,00E+08	1,30E+08	6,96E-03	13949,8	10957,8
12	1,27E+04	1,27E+04	2,34E+08	1,89E+08	1,07E+08	2,30E+08	1,51E+05	1,00E+00	2,75E+03	1,63E+08	6,94E+07	1,57E-03	16613,2	11511,7
13	1,66E+04	1,66E+04	1,33E+08	6,27E+07	5,11E+07	1,46E+08	1,12E+06	1,00E+00	4,95E+05	7,29E+07	5,87E+07	1,26E-03	25544,7	17761,5
14	1,39E+04	1,39E+04	3,60E+07	1,12E+07	6,78E+06	6,51E+07	2,92E+06	6,49E+04	1,31E+06	1,38E+07	2,21E+07	3,31E-04	22360,1	15683,6

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	8,39E+02	8,39E+02	1,32E+05	1,45E+11	5,79E+04	4,19E+11	5,00E+13	1,33E+13	8,06E+07	1,00E+00	1,00E+00	2,83E+00	316,0	316,0
2	1,15E+03	1,15E+03	9,34E+04	3,66E+09	4,02E+03	3,42E+11	1,35E+13	3,48E+12	5,52E+08	1,00E+00	1,00E+00	8,86E-01	465,8	362,9
3	1,26E+03	1,26E+03	9,69E+04	4,46E+04	2,59E+04	2,85E+11	3,74E+12	8,67E+11	3,53E+09	1,00E+00	2,77E+00	3,18E-01	609,7	470,3
4	1,95E+03	1,95E+03	1,95E+05	1,10E+05	2,62E+05	1,89E+11	8,61E+11	1,33E+11	4,74E+10	1,00E+00	2,59E+01	1,87E-01	1468,2	1116,1
5	2,07E+03	2,07E+03	1,97E+05	1,31E+05	3,32E+05	6,72E+10	2,00E+11	1,87E+10	2,49E+10	1,00E+00	1,17E+02	6,00E-02	2075,7	1455,8
6	2,42E+03	2,42E+03	2,13E+05	1,18E+05	2,91E+05	3,40E+10	6,60E+10	5,12E+09	1,11E+10	1,00E+00	2,83E+02	3,71E-02	2927,5	2049,8
7	5,98E+03	5,98E+03	1,49E+06	1,08E+00	1,00E+00	2,64E+10	3,95E+10	1,00E+00	4,99E+07	4,61E+01	1,60E+02	4,47E-02	4784,2	3533,7
8	9,12E+03	9,12E+03	1,24E+09	2,07E+10	5,01E+09	5,62E+09	1,00E+00	1,00E+00	6,73E+03	7,30E+08	4,76E+08	2,96E-02	8578,1	6272,7
9	6,69E+03	6,69E+03	5,20E+09	4,51E+09	6,03E+08	1,37E+09	1,00E+00	1,00E+00	1,00E+00	3,70E+09	1,50E+09	1,34E-02	8006,2	5341,0
10	7,91E+03	7,91E+03	3,93E+09	1,69E+09	3,19E+08	8,29E+08	1,04E+00	1,00E+00	1,00E+00	2,81E+09	1,12E+09	1,00E-02	9135,8	6402,5
11	9,09E+03	9,09E+03	2,00E+09	2,51E+08	8,47E+07	2,26E+06	1,00E+00	1,00E+00	1,00E+00	1,39E+09	6,10E+08	4,90E-03	10619,1	7054,1
12	1,31E+04	1,31E+04	7,61E+08	5,41E+07	3,36E+07	9,83E+07	1,18E+00	1,00E+00	1,00E+00	4,73E+08	2,88E+08	2,64E-03	15913,8	10482,2
13	2,30E+04	2,30E+04	2,12E+08	1,78E+07	1,49E+07	6,08E+07	7,49E+02	1,00E+00	1,02E+03	1,10E+08	1,02E+08	1,58E-03	39338,6	26736,6
14	2,12E+04	2,12E+04	4,39E+07	6,14E+06	5,06E+06	3,82E+07	5,68E+05	9,20E+03	3,69E+05	1,61E+07	2,77E+07	4,01E-04	32970,8	23257,9

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 30,00 TDAT2 = 60,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,13E+03	1,13E+03	1,75E+05	2,68E+04	7,45E+04	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	1,48E+03	1,48E+03	7,35E+04	7,18E+01	3,25E+04	3,03E+11	7,76E+12	1,94E+12	3,42E+10	1,00E+00	1,00E+00	6,05E-01	641,3	437,5
3	1,99E+03	1,99E+03	2,48E+05	2,64E+04	1,00E+00	4,03E+11	2,68E+12	5,07E+11	1,31E+11	1,00E+00	5,52E+00	5,42E-01	1259,3	1066,2
4	3,42E+03	3,42E+03	5,73E+05	6,66E+06	1,32E+07	3,40E+11	4,57E+11	1,00E+00	9,90E+05	1,00E+00	2,81E+01	4,96E-01	5722,4	4504,8
5	4,90E+03	4,90E+03	1,48E+07	6,82E+09	7,78E+06	8,26E+10	7,36E+10	1,00E+00	1,65E+03	2,46E+00	5,02E+01	1,04E-01	6288,6	4111,4
6	6,44E+03	6,44E+03	1,12E+09	5,87E+10	1,47E+10	1,82E+10	9,18E+01	1,00E+00	1,00E+00	9,01E+07	9,32E+08	5,77E-02	5979,8	4288,3
7	7,11E+03	7,11E+03	9,57E+09	2,05E+10	2,40E+09	3,79E+09	5,90E+00	1,00E+00	1,00E+00	5,37E+09	4,18E+09	3,52E-02	7947,5	5389,8
8	6,79E+03	6,79E+03	8,65E+09	7,59E+09	9,66E+08	1,71E+09	1,69E+00	1,00E+00	1,00E+00	6,02E+09	2,62E+09	2,17E-02	8599,8	5475,2
9	6,91E+03	6,91E+03	6,72E+09	2,83E+09	4,42E+08	8,18E+08	1,09E+00	1,00E+00	1,00E+00	4,87E+09	1,84E+09	1,39E-02	9149,1	5426,9
10	7,02E+03	7,02E+03	4,45E+09	7,11E+08	1,64E+08	2,92E+08	1,00E+00	1,00E+00	1,00E+00	3,19E+09	1,26E+09	8,07E-03	9265,4	5240,3
11	7,87E+03	7,87E+03	2,55E+09	1,36E+08	3,87E+07	1,03E+08	1,00E+00	1,00E+00	1,00E+00	1,73E+09	8,18E+08	4,73E-03	10172,8	5830,5
12	9,62E+03	9,62E+03	1,48E+09	2,22E+07	7,01E+06	2,57E+07	1,00E+00	1,00E+00	1,00E+00	8,80E+08	6,00E+08	3,26E-03	12978,2	7977,2
13	2,30E+04	2,30E+04	3,79E+08	8,75E+06	7,34E+06	2,82E+07	1,00E+00	1,00E+00	1,00E+00	1,81E+08	1,97E+08	2,66E-03	51700,9	32601,9
14	2,30E+04	2,30E+04	4,19E+07	3,95E+06	3,28E+06	2,56E+07	1,89E+05	2,47E+03	1,48E+05	1,49E+07	2,69E+07	3,64E-04	44426,3	27299,0

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 90,0
KCYC= 14 TIMDEL= 3,600000E-02 TIMTOT= 1,274000E+00 TTX= 1,243700E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,107106E+09	1,687568E+00
2	9,357187E+06	1,570075E-09	9,804278E+01	9,855497E-01	1,130317E+09	8,873415E-01
3	1,003365E+07	4,794661E-10	4,769092E+02	9,710878E-01	1,267017E+09	3,037459E-01
4	1,072581E+07	1,603973E-10	1,166943E+03	9,363286E-01	1,436990E+09	1,152447E-01
5	1,153223E+07	5,108875E-11	2,619354E+03	9,272606E-01	1,878077E+09	4,797430E-02
6	1,247434E+07	1,710656E-11	4,448547E+03	9,428660E-01	2,788673E+09	2,385508E-02
7	1,359581E+07	6,935431E-12	5,930116E+03	9,345146E-01	3,896639E+09	1,351244E-02
8	1,492079E+07	3,324359E-12	8,712665E+03	9,010299E-01	4,847838E+09	8,057976E-03
9	1,646060E+07	1,671070E-12	1,420795E+04	9,156687E-01	6,500117E+09	5,431077E-03
10	1,838869E+07	7,578131E-13	2,380497E+04	1,008002E+00	8,579339E+09	3,250768E-03
11	2,112742E+07	2,380090E-13	2,169279E+04	9,840852E-01	1,405700E+10	1,672846E-03
12	2,678598E+07	6,577517E-14	3,480522E+04	8,825112E-01	1,785400E+10	5,871749E-04
13	3,440488E+07	1,896059E-14	6,965154E+04	8,487669E-01	3,122420E+10	2,960146E-04
14	4,669118E+07	4,508486E-15	1,431871E+05	8,213228E-01	4,279088E+10	9,646105E-05

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 4,82503E-02 CM, X= 6,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 3,95531E-01 CM, X= 6,40000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 90,0
KCYC= 19 TIMDEL= 4,800000E-02 TIMTOT= 1,322000E+00 TTX= 1,249400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,113806E+09	1,697781E+00
2	9,366901E+06	1,485787E-09	1,611628E+02	9,723694E-01	1,135122E+09	8,432745E-01
3	1,010493E+07	4,425576E-10	7,616323E+02	9,339866E-01	1,315990E+09	2,912008E-01
4	1,085646E+07	1,471236E-10	2,465168E+03	8,783661E-01	1,442176E+09	1,060891E-01
5	1,174925E+07	4,442915E-11	5,909979E+03	9,008500E-01	2,150417E+09	4,777060E-02
6	1,289538E+07	1,445708E-11	8,866713E+03	9,314418E-01	3,346141E+09	2,418771E-02
7	1,418188E+07	6,476003E-12	1,025470E+04	9,113592E-01	4,403537E+09	1,425866E-02
8	1,553153E+07	3,346612E-12	1,385679E+04	8,728253E-01	5,688538E+09	9,518666E-03
9	1,706315E+07	1,794900E-12	2,356882E+04	8,645898E-01	7,868589E+09	7,061664E-03
10	1,878032E+07	8,576667E-13	4,250526E+04	9,348573E-01	1,074762E+10	4,608939E-03
11	2,118366E+07	2,093783E-13	5,838800E+04	9,070641E-01	2,503328E+10	2,620712E-03
12	3,021345E+07	4,383235E-14	9,567313E+04	7,924059E-01	3,002691E+10	6,580750E-04
13	4,028625E+07	1,466898E-14	1,722825E+05	7,672524E-01	5,562719E+10	4,079970E-04
14	5,585410E+07	3,544283E-15	3,100161E+05	7,469903E-01	6,393595E+10	1,133036E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 6,90311E-01 CM, X= 6,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,70154E+00 CM, X= 6,80000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 90,0
KCYC= 21 TIMDEL= 5,200000E-02 TIMTOT= 1,374000E+00 TTX= 1,255400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,148965E+09	1,751375E+00
2	9,401363E+06	1,353616E-09	7,324371E+02	9,314496E-01	1,165244E+09	7,886469E-01
3	1,021572E+07	3,866516E-10	1,729700E+03	8,905203E-01	1,374497E+09	2,671003E-01
4	1,110107E+07	1,187211E-10	5,170828E+03	8,382068E-01	1,634031E+09	9,699697E-02
5	1,225792E+07	3,336296E-11	1,005904E+04	8,780124E-01	2,829465E+09	4,719966E-02
6	1,381832E+07	1,232415E-11	1,181710E+04	9,353403E-01	4,465929E+09	2,751939E-02
7	1,511262E+07	6,629187E-12	1,529749E+04	8,671345E-01	5,712405E+09	1,893430E-02
8	1,642438E+07	3,284461E-12	3,400929E+04	7,143549E-01	7,974297E+09	1,309563E-02
9	1,806282E+07	1,551144E-12	5,859552E+04	6,098824E-01	1,054574E+10	8,178986E-03
10	2,020970E+07	5,964089E-13	1,021701E+05	5,204302E-01	1,564158E+10	4,664386E-03
11	2,423846E+07	1,236343E-13	1,998028E+05	5,921786E-01	5,099008E+10	3,152063E-03
12	4,058470E+07	2,494042E-14	2,369857E+05	7,949109E-01	6,495738E+10	8,100321E-04
13	5,691033E+07	9,691665E-15	4,277757E+05	6,606534E-01	1,038674E+11	5,033240E-04
14	7,679699E+07	2,621696E-15	6,630489E+05	6,421046E-01	9,813111E+10	1,286350E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 5,06189E-01 CM, X= 6,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,74207E+00 CM, X= 8,20000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 90,0
KCYC= 28 TIMDEL= 6,700000E-02 TIMTOT= 1,441000E+00 TTX= 1,262900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,261916E+09	1,923546E+00
2	9,514593E+06	1,105273E-09	2,231636E+03	8,542582E-01	1,296005E+09	7,164408E-01
3	1,046631E+07	3,195912E-10	3,494336E+03	8,673762E-01	1,519770E+09	2,428526E-01
4	1,159451E+07	8,203533E-11	9,397043E+03	8,094274E-01	2,538345E+09	1,041170E-01
5	1,352481E+07	2,077605E-11	2,805493E+04	7,134235E-01	4,738641E+09	4,922513E-02
6	1,593336E+07	7,999388E-12	5,131902E+04	6,740878E-01	5,616475E+09	2,246418E-02
7	1,789073E+07	4,836216E-12	5,677843E+04	8,881578E-01	9,104151E+09	2,201482E-02
8	1,941878E+07	2,654014E-12	4,918638E+04	9,387139E-01	1,535448E+10	2,037551E-02
9	2,132549E+07	7,574955E-13	9,616697E+04	6,636808E-01	4,046540E+10	1,532618E-02
10	3,348780E+07	1,885063E-13	3,051367E+05	6,345971E-01	5,349252E+10	5,041840E-03
11	3,954385E+07	7,767132E-14	3,367211E+05	8,275630E-01	1,348948E+11	5,238727E-03
12	7,145631E+07	1,072611E-14	7,016869E+05	5,925393E-01	1,333032E+11	7,149127E-04
13	1,040440E+08	5,420358E-15	1,132981E+06	5,610247E-01	1,946604E+11	5,275646E-04
14	1,234559E+08	1,779471E-15	1,475746E+06	5,509965E-01	1,520557E+11	1,352893E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 1,70746E-01 CM, X= 6,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,28094E+00 CM, X= 6,40000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 90,0
KCYC= 19 TIMDEL= 4,700000E-02 TIMTOT= 1,488000E+00 TTX= 1,268500E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,854019E+09	2,826093E+00
2	9,797485E+06	7,921854E-10	8,767954E+03	6,944869E-01	1,731307E+09	6,857582E-01
3	1,136883E+07	2,208625E-10	1,580607E+04	7,544982E-01	2,305455E+09	2,545943E-01
4	1,399863E+07	3,642697E-11	4,727063E+04	6,519174E-01	5,505912E+09	1,002818E-01
5	1,738761E+07	1,509168E-11	8,416378E+04	6,697846E-01	6,970711E+09	5,259989E-02
6	2,136631E+07	6,408995E-12	1,233101E+05	7,000148E-01	9,246997E+09	2,963198E-02
7	2,588256E+07	2,656733E-12	1,648307E+05	6,734567E-01	1,650314E+10	2,192222E-02
8	3,176432E+07	8,243628E-13	2,470472E+05	5,898437E-01	4,081743E+10	1,682419E-02
9	3,957308E+07	3,558719E-13	3,670560E+05	5,754891E-01	6,139587E+10	1,092453E-02
10	4,832262E+07	2,256634E-13	4,717217E+05	6,124234E-01	7,088032E+10	7,997548E-03
11	5,849542E+07	1,340462E-13	5,948861E+05	6,045536E-01	8,327685E+10	5,561470E-03
12	7,038490E+07	7,776767E-14	7,486566E+05	5,887920E-01	1,002775E+11	3,899174E-03
13	8,398402E+07	3,993161E-14	9,239735E+05	5,866635E-01	1,177425E+11	2,350823E-03
14	9,878211E+07	1,983712E-14	1,109462E+06	5,868852E-01	1,510181E+11	1,497883E-03

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 2,81245E-01 CM, X= 6,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,94028E+00 CM, X= 6,40000E+01 SEC

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 90,0
KCYC= 19 TIMDEL= 4,800000E-02 TIMTOT= 1,536000E+00 TTX= 1,274200E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	3,827242E+09	5,833889E+00
2	1,001316E+07	9,915643E-10	1,571529E+04	6,105346E-01	2,611173E+09	1,294573E+00
3	1,158298E+07	3,750630E-10	2,484071E+04	9,374228E-01	2,879903E+09	5,400725E-01
4	1,319826E+07	1,106465E-10	1,897005E+04	8,445272E-01	7,533231E+09	4,167627E-01
5	1,689104E+07	1,436410E-11	8,143953E+04	5,716898E-01	3,007164E+10	2,159760E-01
6	2,162569E+07	9,039314E-12	1,447674E+05	5,751181E-01	3,605094E+10	1,629379E-01
7	2,713816E+07	6,179636E-12	2,229674E+05	5,790904E-01	3,696881E+10	1,142269E-01
8	3,348008E+07	3,973265E-12	3,089411E+05	5,820550E-01	3,800305E+10	7,549808E-02
9	4,084854E+07	2,493042E-12	3,990688E+05	6,225437E-01	4,049377E+10	5,047632E-02
10	4,887992E+07	1,619274E-12	4,863572E+05	6,542429E-01	4,256150E+10	3,445937E-02
11	5,863220E+07	7,803148E-13	5,974212E+05	6,242447E-01	5,458428E+10	2,129646E-02
12	7,022152E+07	3,909980E-13	7,360515E+05	5,979980E-01	6,816997E+10	1,332716E-02
13	8,381802E+07	2,173868E-13	9,075914E+05	5,693712E-01	7,477381E+10	8,127421E-03
14	9,957867E+07	1,173518E-13	1,115770E+06	5,498508E-01	8,200433E+10	4,811678E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,86E+02	3,86E+02	3,98E+04	1,18E+09	1,02E+04	2,26E+11	5,01E+13	1,34E+13	6,33E+07	1,00E+00	1,00E+00	1,69E+00	191,8	191,8
2	4,37E+02	4,37E+02	4,20E+04	7,78E+08	1,43E+04	3,12E+11	2,58E+13	6,82E+12	1,31E+08	1,00E+00	1,00E+00	6,88E-01	196,6	195,2
3	5,52E+02	5,52E+02	1,56E+05	6,98E+08	7,09E+04	4,02E+11	7,87E+12	1,93E+12	1,34E+08	1,00E+00	1,90E+00	3,04E-01	218,7	215,5
4	6,00E+02	6,00E+02	1,64E+05	3,33E+08	7,47E+04	2,87E+11	2,63E+12	5,69E+11	2,16E+08	1,00E+00	1,52E+01	1,15E-01	247,1	239,1
5	6,39E+02	6,39E+02	1,71E+05	2,04E+08	7,41E+04	1,27E+11	8,39E+11	1,63E+11	2,19E+08	1,00E+00	7,91E+01	4,81E-02	319,3	307,5
6	7,42E+02	7,42E+02	1,65E+05	1,66E+08	5,74E+04	4,82E+10	2,81E+11	5,20E+10	2,10E+08	1,00E+00	2,55E+02	2,40E-02	466,7	453,2
7	7,98E+02	7,98E+02	1,56E+05	1,16E+08	4,11E+04	2,54E+10	1,13E+11	1,89E+10	1,70E+08	1,00E+00	8,30E+02	1,36E-02	643,0	621,6
8	6,93E+02	6,93E+02	1,57E+05	4,87E+07	5,95E+04	1,54E+10	5,33E+10	8,15E+09	7,39E+07	1,00E+00	2,88E+03	8,07E-03	799,0	758,4
9	7,72E+02	7,72E+02	2,14E+05	4,14E+07	5,81E+05	9,84E+09	2,61E+10	3,61E+09	5,37E+07	1,94E+00	2,29E+04	5,45E-03	1036,5	991,8
10	9,30E+02	9,30E+02	1,05E+06	3,62E+07	5,06E+06	5,83E+09	1,13E+10	1,39E+09	3,11E+07	1,60E+01	7,97E+05	3,27E-03	1259,1	1264,2
11	1,91E+03	1,91E+03	4,89E+06	7,28E+07	1,82E+07	2,57E+09	3,24E+09	2,99E+08	2,29E+07	4,44E+02	4,50E+06	1,70E-03	1958,7	1943,0
12	2,66E+03	2,66E+03	6,26E+06	3,82E+07	1,10E+07	9,85E+08	7,62E+08	5,08E+07	4,43E+06	3,33E+05	5,61E+06	5,97E-04	2423,6	2276,8
13	4,43E+03	4,43E+03	1,55E+07	2,44E+07	4,42E+06	3,86E+08	1,57E+08	5,85E+06	7,12E+05	7,89E+06	7,49E+06	3,05E-04	3780,6	3483,0
14	4,58E+03	4,58E+03	9,13E+06	4,67E+06	1,24E+06	1,16E+08	2,14E+07	9,59E+05	1,96E+05	3,66E+06	5,45E+06	9,72E-05	4681,5	4242,7

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,00E+02	4,00E+02	4,14E+04	1,82E+09	1,06E+04	2,28E+11	5,01E+13	1,34E+13	1,72E+07	1,00E+00	1,00E+00	1,70E+00	192,9	192,9
2	4,93E+02	4,93E+02	4,60E+04	2,52E+09	1,44E+04	3,00E+11	2,44E+13	6,45E+12	3,27E+06	1,00E+00	1,00E+00	8,43E-01	198,8	196,0
3	6,37E+02	6,37E+02	1,57E+05	2,05E+09	6,25E+04	3,75E+11	7,27E+12	1,78E+12	6,01E+06	1,00E+00	1,93E+00	2,91E-01	231,6	223,8
4	6,25E+02	6,25E+02	1,57E+05	3,63E+08	6,48E+04	2,65E+11	2,42E+12	5,21E+11	1,94E+08	1,00E+00	1,49E+01	1,06E-01	256,0	239,9
5	7,47E+02	7,47E+02	1,68E+05	2,66E+08	6,20E+04	1,14E+11	7,30E+11	1,40E+11	2,20E+08	1,00E+00	8,50E+01	4,80E-02	370,3	351,5
6	8,94E+02	8,94E+02	1,64E+05	1,86E+08	4,48E+04	4,28E+10	2,37E+11	4,29E+10	2,96E+08	1,00E+00	2,77E+02	2,44E-02	561,4	541,8
7	8,50E+02	8,50E+02	1,53E+05	1,17E+08	3,62E+04	2,46E+10	1,05E+11	1,72E+10	2,25E+08	1,00E+00	8,75E+02	1,43E-02	733,6	700,3
8	8,19E+02	8,19E+02	1,67E+05	7,29E+07	5,53E+04	1,60E+10	5,36E+10	7,94E+09	1,29E+08	1,00E+00	3,05E+03	9,55E-03	949,5	887,1
9	9,54E+02	9,54E+02	2,47E+05	6,63E+07	5,39E+05	1,09E+10	2,80E+10	3,71E+09	9,91E+07	3,27E+00	2,40E+04	7,10E-03	1286,6	1196,4
10	1,20E+03	1,20E+03	1,32E+06	7,61E+07	7,76E+06	6,77E+09	1,28E+10	1,47E+09	6,54E+07	3,19E+01	9,71E+05	4,67E-03	1630,6	1576,6
11	3,53E+03	3,53E+03	2,87E+06	1,73E+08	3,14E+07	2,54E+09	2,76E+09	1,30E+08	4,81E+07	1,83E+03	2,01E+06	2,69E-03	3506,3	3339,4
12	5,06E+03	5,06E+03	1,20E+07	8,64E+07	1,19E+07	7,14E+08	4,69E+08	9,16E+06	3,06E+06	6,82E+06	4,80E+06	6,78E-04	4049,2	3604,5
13	6,33E+03	6,33E+03	2,91E+07	5,11E+07	6,57E+06	3,01E+08	9,85E+07	1,30E+06	8,06E+05	1,79E+07	1,09E+07	4,16E-04	6492,3	5086,8
14	5,90E+03	5,90E+03	1,24E+07	6,93E+06	1,54E+06	8,82E+07	1,38E+07	5,12E+05	4,36E+05	5,01E+06	7,34E+06	1,14E-04	6954,3	6010,5

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,54E+02	4,54E+02	4,76E+04	7,71E+09	1,21E+04	2,37E+11	5,01E+13	1,34E+13	1,52E+05	1,00E+00	1,00E+00	1,75E+00	199,0	199,0
2	5,88E+02	5,88E+02	5,14E+04	1,03E+10	1,38E+04	2,83E+11	2,22E+13	5,87E+12	1,15E+05	1,00E+00	1,00E+00	7,89E-01	208,4	201,2
3	7,36E+02	7,36E+02	1,53E+05	5,09E+09	5,08E+04	3,35E+11	6,38E+12	1,56E+12	3,88E+05	1,00E+00	1,92E+00	2,67E-01	247,6	233,6
4	7,55E+02	7,55E+02	1,48E+05	8,79E+08	4,85E+04	2,20E+11	1,95E+12	4,17E+11	4,12E+07	1,00E+00	1,59E+01	9,71E-02	296,5	271,4
5	9,46E+02	9,46E+02	1,58E+05	2,94E+08	3,97E+04	9,21E+10	5,48E+11	1,02E+11	2,75E+08	1,00E+00	9,61E+01	4,75E-02	491,2	460,3
6	1,06E+03	1,06E+03	1,63E+05	5,36E+07	5,23E+04	4,01E+10	2,02E+11	3,47E+10	6,83E+08	1,00E+00	3,19E+02	2,77E-02	742,4	718,0
7	9,16E+02	9,16E+02	1,54E+05	6,39E+07	4,02E+04	2,70E+10	1,08E+11	1,66E+10	3,86E+08	1,00E+00	9,82E+02	1,90E-02	970,0	903,2
8	1,12E+03	1,12E+03	1,68E+05	4,39E+07	1,00E+00	1,70E+10	5,25E+10	7,05E+09	3,59E+08	1,00E+00	2,80E+03	1,32E-02	1459,5	1233,5
9	1,42E+03	1,42E+03	2,50E+05	4,56E+07	1,00E+00	1,02E+10	2,41E+10	2,74E+09	3,12E+08	4,93E+00	1,04E+04	8,33E-03	2033,3	1587,9
10	2,18E+03	2,18E+03	5,67E+05	6,14E+07	3,90E+04	5,33E+09	6,81E+09	6,72E+08	2,54E+08	5,78E+01	1,27E+05	4,87E-03	3117,6	2249,1
11	7,62E+03	7,62E+03	2,11E+06	9,43E+08	6,08E+07	1,68E+09	1,24E+09	1,00E+00	1,11E+08	2,73E+04	2,52E+04	3,42E-03	7494,6	5767,3
12	7,22E+03	7,22E+03	2,54E+07	2,76E+08	4,76E+07	4,15E+08	1,47E+08	1,00E+00	3,81E+06	2,05E+07	4,14E+06	8,37E-04	7002,0	6242,8
13	8,69E+03	8,69E+03	4,06E+07	9,94E+07	2,15E+07	1,86E+08	2,36E+07	3,73E+02	3,09E+06	2,39E+07	1,64E+07	5,15E-04	10941,7	8893,5
14	7,82E+03	7,82E+03	1,58E+07	9,39E+06	2,38E+06	6,13E+07	6,20E+06	1,79E+05	1,10E+06	6,33E+06	9,45E+06	1,30E-04	10551,3	8454,9

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,56E+02	5,56E+02	5,96E+04	3,94E+10	1,50E+04	2,62E+11	5,00E+13	1,34E+13	6,55E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	7,72E+02	7,72E+02	5,79E+04	3,85E+10	1,21E+04	2,54E+11	1,81E+13	4,78E+12	7,44E+05	1,00E+00	1,00E+00	7,17E-01	241,9	223,6
3	8,83E+02	8,83E+02	1,47E+05	1,08E+10	3,59E+04	2,86E+11	5,24E+12	1,28E+12	1,26E+06	1,00E+00	2,08E+00	2,43E-01	277,0	258,0
4	1,05E+03	1,05E+03	1,35E+05	9,62E+08	2,47E+04	1,74E+11	1,35E+12	2,78E+11	1,07E+08	1,00E+00	1,98E+01	1,05E-01	465,7	419,0
5	1,41E+03	1,41E+03	1,15E+05	1,25E+01	5,67E+03	7,11E+10	3,40E+11	5,59E+10	5,25E+09	1,00E+00	1,07E+02	4,92E-02	895,9	756,7
6	1,14E+03	1,14E+03	9,52E+04	2,55E+04	3,53E+04	3,10E+10	1,31E+11	1,97E+10	2,30E+09	1,00E+00	3,46E+02	2,25E-02	1082,0	886,3
7	1,41E+03	1,41E+03	1,60E+05	4,06E+04	6,09E+04	2,41E+10	7,83E+10	9,60E+09	1,87E+09	1,00E+00	1,08E+03	2,20E-02	1488,7	1403,0
8	2,15E+03	2,15E+03	2,62E+05	1,25E+05	2,37E+05	1,75E+10	4,21E+10	3,51E+09	1,61E+09	1,00E+00	2,55E+03	2,04E-02	2356,6	2283,2
9	6,61E+03	6,61E+03	3,76E+06	1,63E+09	4,47E+07	8,51E+09	1,10E+10	1,00E+00	3,12E+07	2,96E+02	1,37E+03	1,58E-02	6451,2	5255,6
10	8,18E+03	8,18E+03	2,11E+06	1,77E+09	3,42E+07	2,43E+09	2,13E+09	1,00E+00	7,71E+07	3,91E+03	3,70E+03	5,49E-03	7209,3	5743,0
11	9,90E+03	9,90E+03	5,24E+08	1,45E+09	4,85E+08	8,84E+08	1,00E+00	1,00E+00	7,41E+02	4,00E+08	1,17E+08	5,25E-03	10618,2	9659,4
12	1,01E+04	1,01E+04	1,38E+08	1,24E+08	5,16E+07	1,37E+08	4,50E+04	1,00E+00	8,59E+02	9,60E+07	4,15E+07	7,16E-04	11037,1	8496,0
13	1,37E+04	1,37E+04	7,36E+07	4,20E+07	2,37E+07	8,28E+07	4,86E+05	1,00E+00	1,46E+05	4,05E+07	3,29E+07	5,29E-04	17444,6	13066,3
14	1,09E+04	1,09E+04	1,96E+07	7,21E+06	3,54E+06	3,61E+07	1,50E+06	2,74E+04	1,05E+06	7,44E+06	1,21E+07	1,36E-04	15304,8	11360,6

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,71E+02	7,71E+02	8,43E+04	1,25E+11	2,09E+04	4,40E+11	5,00E+13	1,33E+13	9,33E+07	1,00E+00	1,00E+00	2,86E+00	320,3	320,3
2	1,03E+03	1,03E+03	5,27E+04	5,46E+09	8,32E+03	2,51E+11	1,30E+13	3,38E+12	5,20E+07	1,00E+00	1,00E+00	6,88E-01	358,1	298,4
3	1,23E+03	1,23E+03	7,32E+04	1,72E+01	1,28E+04	2,23E+11	3,63E+12	8,60E+11	2,45E+09	1,00E+00	1,11E+00	2,55E-01	450,6	391,4
4	1,92E+03	1,92E+03	9,15E+04	1,00E+00	1,00E+00	1,25E+11	5,94E+11	9,32E+10	4,30E+10	1,00E+00	2,44E+01	1,00E-01	1070,1	864,0
5	2,02E+03	2,02E+03	9,75E+04	1,00E+00	1,00E+00	6,91E+10	2,45E+11	2,82E+10	3,25E+10	1,00E+00	6,89E+01	5,26E-02	1277,3	1045,4
6	2,19E+03	2,19E+03	1,07E+05	1,00E+00	1,00E+00	3,72E+10	1,04E+11	8,27E+09	1,87E+10	1,00E+00	1,84E+02	2,96E-02	1580,1	1322,0
7	3,68E+03	3,68E+03	2,02E+05	2,40E+04	1,24E+00	2,12E+10	4,40E+10	1,23E+06	1,63E+09	1,00E+00	2,85E+02	2,19E-02	2921,4	2397,4
8	5,25E+03	5,25E+03	1,21E+06	1,06E+07	1,13E+07	7,76E+09	1,00E+00	1,00E+00	5,55E+06	3,52E+04	1,04E+05	1,66E-02	20419,7	15682,6
9	6,84E+03	6,84E+03	9,34E+08	8,80E+09	1,73E+09	2,37E+09	4,63E+02	1,00E+00	1,00E+00	5,35E+08	3,86E+08	1,10E-02	6946,7	5269,9
10	6,90E+03	6,90E+03	2,05E+09	2,46E+09	5,44E+08	1,24E+09	3,28E+00	1,00E+00	1,00E+00	1,35E+09	6,96E+08	8,07E-03	7050,3	5517,4
11	5,82E+03	5,82E+03	2,69E+09	2,02E+09	1,89E+08	6,67E+08	1,11E+00	1,00E+00	1,00E+00	1,88E+09	8,08E+08	5,62E-03	5724,3	4450,8
12	6,50E+03	6,50E+03	1,96E+09	7,78E+08	8,36E+07	3,72E+08	1,03E+00	1,00E+00	1,00E+00	1,38E+09	5,79E+08	3,92E-03	6401,6	4912,1
13	6,94E+03	6,94E+03	1,23E+09	2,16E+08	3,11E+07	1,51E+08	1,00E+00	1,00E+00	1,00E+00	8,57E+08	3,76E+08	2,35E-03	6743,2	5164,9
14	8,59E+03	8,59E+03	6,38E+08	7,03E+07	1,94E+07	8,10E+07	1,00E+00	1,00E+00	1,00E+00	4,14E+08	2,24E+08	1,50E-03	8299,7	6358,3

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 60,00 TDAT2 = 90,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	1,04E+03	1,04E+03	1,12E+05	1,01E+04	2,67E+04	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	1,19E+03	1,19E+03	5,78E+04	2,09E+03	1,00E+00	4,61E+11	1,63E+13	4,16E+12	2,41E+10	1,00E+00	1,00E+00	1,29E+00	573,5	448,1
3	1,53E+03	1,53E+03	6,93E+04	5,23E+03	8,67E+03	2,97E+11	6,15E+12	1,47E+12	4,23E+10	1,00E+00	1,00E+00	5,40E-01	507,4	491,2
4	2,14E+03	2,14E+03	1,58E+05	1,56E+04	7,95E+04	3,34E+11	1,86E+12	2,20E+10	3,58E+10	1,00E+00	1,18E+01	4,17E-01	1460,3	1342,0
5	3,30E+03	3,30E+03	1,14E+06	2,83E+06	7,08E+05	1,97E+11	3,02E+11	5,27E+00	2,61E+06	1,00E+00	2,32E+01	2,16E-01	4140,3	3130,5
6	3,69E+03	3,69E+03	2,37E+06	1,50E+07	3,51E+06	1,52E+11	1,89E+11	1,00E+00	3,02E+05	1,00E+00	3,06E+01	1,63E-01	4570,6	3466,2
7	4,03E+03	4,03E+03	2,09E+06	6,93E+07	4,11E+06	1,10E+11	1,24E+11	1,00E+00	6,41E+04	1,00E+00	3,81E+01	1,14E-01	4646,3	3535,8
8	4,43E+03	4,43E+03	1,91E+06	4,43E+08	5,60E+06	7,53E+10	7,64E+10	1,00E+00	7,67E+03	3,77E+00	4,96E+01	7,55E-02	4710,8	3594,0
9	4,92E+03	4,92E+03	3,72E+06	4,36E+09	1,07E+07	5,05E+10	3,54E+10	1,00E+00	1,70E+01	8,77E+01	1,10E+02	5,05E-02	5132,2	4049,4
10	6,07E+03	6,07E+03	5,32E+07	2,49E+10	1,99E+09	1,65E+10	1,38E+02	1,00E+00	2,52E+01	8,93E+05	1,99E+07	3,48E-02	7092,8	5737,0
11	7,24E+03	7,24E+03	1,97E+09	2,03E+10	3,09E+09	4,90E+09	1,89E+01	1,00E+00	1,00E+00	5,10E+08	1,44E+09	2,18E-02	5972,9	4719,1
12	5,49E+03	5,49E+03	5,05E+09	8,73E+09	7,98E+08	1,68E+09	2,01E+00	1,00E+00	1,00E+00	2,98E+09	2,06E+09	1,35E-02	5341,6	4130,6
13	5,38E+03	5,38E+03	4,25E+09	3,59E+09	2,86E+08	8,03E+08	1,18E+00	1,00E+00	1,00E+00	2,94E+09	1,31E+09	8,20E-03	5256,7	3966,5
14	5,44E+03	5,44E+03	3,11E+09	1,25E+09	7,69E+07	3,50E+08	1,03E+00	1,00E+00	1,00E+00	2,23E+09	8,81E+08	4,83E-03	5093,7	3777,1

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        OUTPUT FROM RKAM2G FOR COLUMN ( 1,  1) AND TIME =  120,0
KCYC=   14 TIMDEL= 3,700000E-02 TIMTOT= 1,573000E+00 TTX= 1,293700E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,107283E+09   1,687838E+00
 2   9,364796E+06   1,549769E-09   1,508448E+02    9,870668E-01   1,123390E+09   8,704976E-01
 3   1,004399E+07   4,767114E-10   2,097302E+02    9,942547E-01   1,264789E+09   3,014696E-01
 4   1,074188E+07   1,580069E-10  -9,594995E+01    9,850966E-01   1,429230E+09   1,129141E-01
 5   1,156742E+07   4,932316E-11  -3,167405E+02    9,654407E-01   1,850659E+09   4,564016E-02
 6   1,255371E+07   1,627418E-11   5,771224E+02    9,512307E-01   2,731777E+09   2,222872E-02
 7   1,373017E+07   6,593157E-12   2,703875E+03    9,506485E-01   3,816146E+09   1,258022E-02
 8   1,511816E+07   3,072548E-12   4,705287E+03    9,242529E-01   4,667787E+09   7,171000E-03
 9   1,682491E+07   1,444822E-12   1,015025E+04    8,646090E-01   6,061514E+09   4,378906E-03
10   1,910696E+07   6,572200E-13   2,224078E+04    8,672587E-01   8,045164E+09   2,643721E-03
11   2,207569E+07   2,211786E-13   4,004242E+04    9,292868E-01   1,377349E+10   1,523200E-03
12   2,801090E+07   5,967962E-14   4,693477E+04    9,073274E-01   1,720915E+10   5,159049E-04
13   3,673135E+07   1,594489E-14   8,452464E+04    8,409486E-01   2,946052E+10   2,348723E-04
14   5,143165E+07   3,669637E-15   1,705515E+05    8,139399E-01   3,889156E+10   7,135896E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    4,63395E-02 CM, X=    9,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=    3,42444E-01 CM, X=    9,40000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=    1,52865E+00 CM, X=    1,02000E+02 SEC

        OUTPUT FROM RKAM2G FOR COLUMN ( 2,  1) AND TIME =  120,0
KCYC=   15 TIMDEL= 4,000000E-02 TIMTOT= 1,613000E+00 TTX= 1,298600E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,113911E+09   1,697941E+00
 2   9,379636E+06   1,474776E-09   1,743808E+02    9,925892E-01   1,130988E+09   8,339767E-01
 3   1,010482E+07   4,417069E-10  -4,770943E+02    9,980777E-01   1,315054E+09   2,904342E-01
 4   1,087591E+07   1,402974E-10  -1,192041E+03    9,536024E-01   1,411585E+09   9,902083E-02
 5   1,183423E+07   4,098565E-11  -5,696137E+02    9,224946E-01   2,073819E+09   4,249842E-02
 6   1,307860E+07   1,350713E-11   2,595148E+03    9,342922E-01   3,260983E+09   2,202326E-02
 7   1,442111E+07   6,088007E-12   5,718359E+03    9,400871E-01   4,293055E+09   1,306808E-02
 8   1,587111E+07   2,897706E-12   9,840997E+03    8,658626E-01   5,311698E+09   7,695870E-03
 9   1,774706E+07   1,346979E-12   2,229147E+04    7,504481E-01   6,857799E+09   4,618656E-03
10   2,014226E+07   5,901222E-13   4,640000E+04    6,880554E-01   9,039712E+09   2,667268E-03
11   2,351917E+07   1,636829E-13   8,884999E+04    7,817566E-01   2,270360E+10   1,858095E-03
12   3,336383E+07   3,773232E-14   1,140267E+05    8,608327E-01   2,868268E+10   5,411319E-04
13   4,582344E+07   1,128460E-14   1,953241E+05    7,692834E-01   5,000197E+10   2,821262E-04
14   6,585065E+07   2,630542E-15   3,523331E+05    7,421929E-01   5,551166E+10   7,301288E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    9,52799E-02 CM, X=    9,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=    6,82037E-01 CM, X=    9,40000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=    1,91552E+00 CM, X=    1,14000E+02 SEC

        OUTPUT FROM RKAM2G FOR COLUMN ( 3,  1) AND TIME =  120,0
KCYC=   18 TIMDEL= 4,700000E-02 TIMTOT= 1,660000E+00 TTX= 1,304100E+01

 K     ALTITUDE,CM    DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,148968E+09   1,751379E+00
 2   9,431645E+06   1,337319E-09   2,759740E+02    9,879601E-01   1,158215E+09   7,744510E-01
 3   1,021248E+07   3,857745E-10  -1,314064E+03    9,925973E-01   1,369444E+09   2,641483E-01
 4   1,115744E+07   1,109168E-10  -1,726457E+03    9,342639E-01   1,581655E+09   8,771605E-02
 5   1,239566E+07   3,108302E-11  -1,155064E+03    9,316627E-01   2,749781E+09   4,273575E-02
 6   1,406281E+07   1,083933E-11   5,202406E+03    8,795193E-01   4,208482E+09   2,280856E-02
 7   1,559959E+07   4,998441E-12   1,751936E+04    7,540051E-01   4,986437E+09   1,246221E-02
 8   1,747735E+07   2,153528E-12   3,491579E+04    6,556716E-01   6,511836E+09   7,011711E-03
 9   1,998648E+07   9,526489E-13   6,603610E+04    6,141588E-01   8,417273E+09   4,009353E-03
10   2,346317E+07   3,618088E-13   1,094098E+05    6,066457E-01   1,271742E+10   2,300638E-03
11   2,956600E+07   8,956058E-14   1,557972E+05    7,243989E-01   4,715113E+10   2,111441E-03
12   4,636789E+07   1,972639E-14   2,794373E+05    7,909405E-01   5,970682E+10   5,888999E-04
13   7,039067E+07   6,722245E-15   4,676018E+05    6,936109E-01   8,857773E+10   2,977206E-04
14   9,765500E+07   1,765276E-15   7,212046E+05    6,733336E-01   8,117430E+10   7,164752E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=    1,49337E-01 CM, X=    9,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=    1,15139E+00 CM, X=    9,40000E+01 SEC
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        OUTPUT FROM RKAM2G FOR COLUMN ( 4,  1) AND TIME =  120,0
KCYC=   19 TIMDEL= 4,800000E-02 TIMTOT= 1,708000E+00 TTX= 1,309700E+01

 K    ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,261967E+09   1,923624E+00
 2   9,579082E+06   1,090667E-09   1,651472E+03    9,587986E-01   1,268619E+09   6,918203E-01
 3   1,076433E+07   2,119067E-10  -3,247377E+03    9,333771E-01   1,672636E+09   1,772214E-01
 4   1,291895E+07   3,413694E-11   9,093269E+03    7,925167E-01   3,035904E+09   5,181824E-02
 5   1,575312E+07   1,051056E-11   2,586148E+04    8,220830E-01   4,684491E+09   2,461831E-02
 6   1,896281E+07   4,228372E-12   4,297147E+04    7,907519E-01   7,351696E+09   1,554285E-02
 7   2,346742E+07   7,405545E-13   9,778040E+04    6,696174E-01   2,530162E+10   9,368614E-03
 8   2,934259E+07   3,340973E-13   1,668501E+05    6,341008E-01   3,632468E+10   6,067989E-03
 9   3,611829E+07   2,117733E-13   2,403063E+05    6,724404E-01   4,227351E+10   4,476200E-03
10   4,382394E+07   1,173732E-13   3,086896E+05    7,221074E-01   5,697408E+10   3,343614E-03
11   5,230604E+07   5,063386E-14   3,988558E+05    7,135323E-01   1,141778E+11   2,840631E-03
12   6,297238E+07   3,080633E-14   5,153817E+05    6,913296E-01   1,120331E+11   1,725664E-03
13   7,434412E+07   1,867463E-14   6,124107E+05    7,100895E-01   1,131374E+11   1,056400E-03
14   8,710430E+07   1,025125E-14   7,213579E+05    7,027429E-01   1,121014E+11   5,745897E-04
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=     5,07481E-02 CM, X=    9,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=     3,84615E-01 CM, X=    9,40000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=     1,80839E+00 CM, X=    1,10000E+02 SEC
FOR COLUMN     5   REZONE NUMBER      2   REQUIRED AT TIME  1,200000E+02

        OUTPUT FROM RKAM2G FOR COLUMN ( 5,  1) AND TIME =  120,0
KCYC=   17 TIMDEL= 4,500000E-02 TIMTOT= 1,753000E+00 TTX= 1,315000E+01

 K    ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,878940E+09   2,860079E+00
 2   1,007683E+07   6,994161E-10   7,331800E+03    8,828945E-01   1,631393E+09   5,705112E-01
 3   1,160588E+07   1,925250E-10   9,993624E+02    8,716961E-01   2,152489E+09   2,072040E-01
 4   1,525059E+07   2,575607E-11   3,533638E+04    7,070605E-01   4,629818E+09   5,962295E-02
 5   1,969318E+07   1,135813E-11   6,845545E+04    7,526082E-01   6,047511E+09   3,434419E-02
 6   2,484577E+07   4,848354E-12   1,080514E+05    7,564921E-01   8,043247E+09   1,949825E-02
 7   3,065914E+07   1,896048E-12   1,535866E+05    7,136765E-01   1,394211E+10   1,321745E-02
 8   3,916614E+07   5,355285E-13   2,447723E+05    6,496271E-01   3,290116E+10   8,809754E-03
 9   5,063599E+07   2,374148E-13   3,669894E+05    6,671357E-01   5,051037E+10   5,995956E-03
10   6,256598E+07   1,557597E-13   4,757542E+05    6,902301E-01   5,942816E+10   4,628257E-03
11   7,653996E+07   8,948476E-14   6,059625E+05    6,712968E-01   6,870591E+10   3,091242E-03
12   9,313125E+07   5,104052E-14   7,648708E+05    6,563205E-01   8,157664E+10   2,081857E-03
13   1,121156E+08   2,596161E-14   9,478507E+05    6,501518E-01   9,510123E+10   1,234490E-03
14   1,326211E+08   1,276477E-14   1,142372E+06    6,434787E-01   1,213416E+11   7,744484E-04
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=     8,83787E-02 CM, X=    9,20000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=     6,52803E-01 CM, X=    9,40000E+01 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=     1,83669E+00 CM, X=    1,18000E+02 SEC
FOR COLUMN     6   REZONE NUMBER      2   REQUIRED AT TIME  1,200000E+02

        OUTPUT FROM RKAM2G FOR COLUMN ( 6,  1) AND TIME =  120,0
KCYC=   19 TIMDEL= 4,800000E-02 TIMTOT= 1,801000E+00 TTX= 1,320700E+01

 K    ALTITUDE,CM    DENSITY,G/CM3   VEL.,CM/SEC     DEN. RATIO     INT. E.,ERG/G  PRESS.,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   3,827243E+09   5,833889E+00
 2   1,053272E+07   8,409123E-10   1,464679E+04    8,480664E-01   2,404643E+09   1,011047E+00
 3   1,204387E+07   3,752032E-10   6,598895E+03    1,000374E+00   2,880442E+09   5,403754E-01
 4   1,371336E+07   8,701962E-11   1,820811E+04    7,864654E-01   6,680692E+09   2,906756E-01
 5   1,956966E+07   9,170648E-12   9,317419E+04    6,384424E-01   2,402809E+10   1,101766E-01
 6   2,589658E+07   6,404198E-12   1,382536E+05    7,084828E-01   3,034505E+10   9,716785E-02
 7   3,386718E+07   4,133844E-12   2,234110E+05    6,689463E-01   3,023698E+10   6,249748E-02
 8   4,276069E+07   2,742718E-12   3,073241E+05    6,902933E-01   3,157521E+10   4,330095E-02
 9   5,279607E+07   1,755155E-12   3,957833E+05    7,040216E-01   3,397985E+10   2,981995E-02
10   6,349832E+07   1,135368E-12   4,867655E+05    7,011582E-01   3,597743E+10   2,042380E-02
11   7,669506E+07   5,343676E-13   6,046771E+05    6,848103E-01   4,618500E+10   1,233984E-02
12   9,248452E+07   2,623568E-13   7,459307E+05    6,709927E-01   5,666103E+10   7,432704E-03
13   1,112377E+08   1,420219E-13   9,181420E+05    6,533141E-01   6,098079E+10   4,330303E-03
14   1,332531E+08   7,495856E-14   1,126803E+06    6,387506E-01   6,585552E+10   2,468218E-03
```

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1   TDAT1 = 90,00   TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,67E+02	3,67E+02	2,90E+04	1,14E+09	6,00E+03	2,27E+11	5,01E+13	1,34E+13	2,45E+07	1,00E+00	1,00E+00	1,69E+00	191,8	191,8
2	4,24E+02	4,24E+02	3,93E+04	7,07E+08	6,30E+03	3,08E+11	2,54E+13	6,73E+12	6,98E+07	1,00E+00	1,00E+00	8,71E-01	195,3	194,0
3	5,46E+02	5,46E+02	1,57E+05	6,39E+08	7,11E+04	4,00E+11	7,83E+12	1,92E+12	7,86E+07	1,00E+00	1,92E+00	3,02E-01	215,8	215,2
4	5,98E+02	5,98E+02	1,69E+05	2,77E+08	7,51E+04	2,83E+11	2,59E+12	5,61E+11	1,66E+08	1,00E+00	1,55E+01	1,13E-01	239,6	237,8
5	6,38E+02	6,38E+02	1,71E+05	1,64E+08	7,24E+04	1,23E+11	8,10E+11	1,58E+11	1,87E+08	1,00E+00	8,00E+01	4,57E-02	308,4	303,0
6	7,42E+02	7,42E+02	1,61E+05	1,31E+08	5,66E+04	4,59E+10	2,67E+11	4,95E+10	1,85E+08	1,00E+00	2,55E+02	2,23E-02	455,1	443,9
7	7,98E+02	7,98E+02	1,54E+05	9,24E+07	4,87E+04	2,42E+10	1,07E+11	1,79E+10	1,58E+08	1,00E+00	8,32E+02	1,26E-02	624,3	606,7
8	6,93E+02	6,93E+02	1,53E+05	4,10E+07	5,90E+04	1,42E+10	4,93E+10	7,53E+09	7,26E+07	1,00E+00	2,89E+03	7,16E-03	759,5	730,2
9	7,72E+02	7,72E+02	1,81E+05	3,28E+07	1,61E+05	8,51E+09	2,26E+10	3,12E+09	5,39E+07	1,63E+00	1,20E+04	4,34E-03	994,5	924,8
10	9,30E+02	9,30E+02	5,34E+05	2,97E+07	2,49E+06	5,07E+09	9,82E+09	1,20E+09	3,34E+07	1,31E+01	3,20E+05	2,66E-03	1272,9	1185,4
11	1,92E+03	1,92E+03	3,11E+06	6,63E+07	1,39E+07	2,40E+09	3,01E+09	2,73E+08	2,57E+07	4,08E+02	2,77E+06	1,54E-03	1974,7	1903,6
12	2,70E+03	2,70E+03	4,70E+06	3,61E+07	9,51E+06	8,96E+08	6,91E+08	4,52E+07	4,79E+06	1,08E+05	4,37E+06	5,21E-04	2313,4	2203,6
13	4,35E+03	4,35E+03	1,19E+07	2,22E+07	3,58E+06	3,27E+08	1,32E+08	4,24E+06	6,49E+05	5,87E+06	5,94E+06	2,40E-04	3578,4	3281,5
14	4,27E+03	4,27E+03	7,33E+06	4,03E+06	9,51E+05	9,43E+07	1,74E+07	7,31E+05	1,83E+05	2,91E+06	4,40E+06	7,18E-05	4266,5	3849,2

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2   TDAT1 = 90,00   TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,79E+02	3,79E+02	3,01E+04	1,80E+09	6,19E+03	2,28E+11	5,01E+13	1,34E+13	4,03E+06	1,00E+00	1,00E+00	1,70E+00	193,0	193,0
2	4,78E+02	4,78E+02	4,10E+04	2,50E+09	7,16E+03	2,96E+11	2,42E+13	6,40E+12	4,82E+05	1,00E+00	1,00E+00	8,34E-01	196,0	195,3
3	6,29E+02	6,29E+02	1,62E+05	2,04E+09	6,44E+04	3,75E+11	7,25E+12	1,77E+12	1,30E+06	1,00E+00	2,00E+00	2,90E-01	223,9	223,6
4	6,23E+02	6,23E+02	1,60E+05	2,98E+08	6,29E+04	2,52E+11	2,30E+12	4,97E+11	1,46E+08	1,00E+00	1,53E+01	9,91E-02	240,5	234,8
5	7,46E+02	7,46E+02	1,63E+05	2,04E+08	5,69E+04	1,05E+11	6,73E+11	1,30E+11	1,79E+08	1,00E+00	8,48E+01	4,26E-02	352,9	338,9
6	8,94E+02	8,94E+02	1,58E+05	1,29E+08	4,61E+04	4,00E+10	2,22E+11	4,01E+10	2,60E+08	1,00E+00	2,75E+02	2,21E-02	546,2	528,0
7	8,50E+02	8,50E+02	1,51E+05	8,56E+07	4,37E+04	2,32E+10	9,91E+10	1,61E+10	2,09E+08	1,00E+00	8,83E+02	1,31E-02	704,0	682,6
8	8,19E+02	8,19E+02	1,54E+05	5,33E+07	5,18E+04	1,38E+10	4,64E+10	6,87E+09	1,26E+08	1,00E+00	2,97E+03	7,72E-03	890,0	828,1
9	9,54E+02	9,54E+02	1,75E+05	4,16E+07	1,12E+05	8,16E+09	2,10E+10	2,78E+09	9,91E+07	2,31E+00	1,07E+04	4,64E-03	1203,3	1042,4
10	1,20E+03	1,20E+03	4,80E+05	4,54E+07	2,30E+06	4,67E+09	8,79E+09	1,01E+09	6,84E+07	2,14E+01	2,72E+05	2,69E-03	1598,3	1325,8
11	3,54E+03	3,54E+03	1,29E+06	1,24E+08	2,01E+07	2,00E+09	2,16E+09	9,25E+07	4,86E+07	1,34E+03	7,36E+05	1,90E-03	3422,9	3026,4
12	5,04E+03	5,04E+03	8,16E+06	7,77E+07	1,01E+07	6,18E+08	4,03E+08	6,73E+06	2,79E+06	4,66E+06	3,20E+06	5,51E-04	3705,9	3438,4
13	5,85E+03	5,85E+03	2,11E+07	4,21E+07	4,61E+06	2,33E+08	7,51E+07	6,70E+05	5,71E+05	1,32E+07	7,83E+06	2,86E-04	5799,8	5087,0
14	5,32E+03	5,32E+03	9,07E+06	5,46E+06	1,06E+06	6,57E+07	1,02E+07	3,47E+05	3,93E+05	3,65E+06	5,40E+06	7,35E-05	6025,9	5191,4

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3   TDAT1 = 90,00   TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,28E+02	4,28E+02	3,46E+04	7,71E+09	6,95E+03	2,37E+11	5,01E+13	1,34E+13	1,48E+05	1,00E+00	1,00E+00	1,75E+00	199,0	199,0
2	5,68E+02	5,68E+02	4,22E+04	1,02E+10	8,38E+03	2,80E+11	2,20E+13	5,80E+12	7,46E+04	1,00E+00	1,00E+00	7,74E-01	201,2	200,0
3	7,28E+02	7,28E+02	1,62E+05	5,05E+09	5,35E+04	3,33E+11	6,33E+12	1,55E+12	2,25E+05	1,00E+00	2,04E+00	2,64E-01	233,6	232,8
4	7,53E+02	7,53E+02	1,53E+05	8,00E+08	4,61E+04	2,06E+11	1,82E+12	3,90E+11	2,09E+07	1,00E+00	1,65E+01	8,78E-02	271,8	262,7
5	9,45E+02	9,45E+02	1,59E+05	2,13E+08	4,16E+04	8,58E+10	5,10E+11	9,52E+10	2,22E+08	1,00E+00	9,79E+01	4,29E-02	463,4	447,3
6	1,06E+03	1,06E+03	1,44E+05	2,34E+07	3,46E+04	3,53E+10	1,78E+11	3,05E+10	6,66E+08	1,00E+00	3,04E+02	2,29E-02	721,3	676,4
7	9,16E+02	9,16E+02	1,17E+05	2,91E+07	3,17E+04	2,04E+10	8,13E+10	1,25E+10	3,77E+08	1,00E+00	8,75E+02	1,25E-02	907,7	788,2
8	1,12E+03	1,12E+03	1,17E+05	1,61E+07	6,12E+04	1,12E+10	3,45E+10	4,62E+09	3,54E+08	1,00E+00	2,48E+03	7,04E-03	1242,4	1006,0
9	1,42E+03	1,42E+03	1,36E+05	1,66E+07	9,34E+04	6,27E+09	1,48E+10	1,66E+09	3,08E+08	1,71E+00	7,18E+03	4,03E-03	1612,3	1263,5
10	2,18E+03	2,18E+03	2,06E+05	2,52E+07	1,69E+05	3,25E+09	5,35E+09	4,04E+08	2,49E+08	2,21E+01	3,94E+04	2,33E-03	2329,9	1814,7
11	7,58E+03	7,58E+03	1,15E+06	6,33E+08	3,63E+07	1,28E+09	9,55E+08	1,00E+00	5,17E+07	1,10E+04	1,83E+04	2,28E-03	6142,7	5228,2
12	6,73E+03	6,73E+03	1,83E+07	2,24E+08	3,59E+07	3,31E+08	1,17E+08	1,00E+00	1,87E+06	1,49E+07	2,91E+06	5,98E-04	6417,5	5707,4
13	7,35E+03	7,35E+03	2,69E+07	7,30E+07	1,46E+07	1,32E+08	1,59E+07	1,22E+02	1,92E+06	1,57E+07	1,11E+07	3,03E-04	8953,6	7456,8
14	6,73E+03	6,73E+03	1,05E+07	6,82E+06	1,51E+06	4,14E+07	4,12E+06	1,07E+05	9,81E+05	4,16E+06	6,32E+06	7,22E-05	8402,1	6894,5

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	5,19E+02	5,19E+02	4,30E+04	3,94E+10	8,42E+03	2,62E+11	5,00E+13	1,34E+13	6,54E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	7,40E+02	7,40E+02	4,37E+04	3,69E+10	8,56E+03	2,44E+11	1,79E+13	4,72E+12	2,87E+05	1,00E+00	1,00E+00	6,92E-01	223,5	218,8
3	9,19E+02	9,19E+02	1,49E+05	5,46E+09	3,54E+04	2,36E+11	3,48E+12	8,12E+11	1,84E+06	1,00E+00	3,80E+00	1,77E-01	293,2	283,3
4	1,22E+03	1,22E+03	1,13E+05	9,25E+04	2,18E+04	9,07E+10	5,60E+11	1,04E+11	6,65E+08	1,00E+00	4,45E+01	5,18E-02	558,5	497,2
5	1,27E+03	1,27E+03	1,11E+05	1,26E+04	1,16E+04	3,83E+10	1,72E+11	2,70E+10	3,45E+09	1,00E+00	2,06E+02	2,46E-02	818,4	742,1
6	1,36E+03	1,36E+03	1,17E+05	1,77E+04	1,52E+04	2,00E+10	6,86E+10	8,76E+09	1,95E+09	1,00E+00	8,16E+02	1,55E-02	1279,5	1137,8
7	5,26E+03	5,26E+03	5,90E+05	5,67E+07	4,84E+06	7,09E+09	1,10E+10	4,75E+02	9,49E+07	3,48E+01	1,37E+03	9,39E-03	4543,8	3718,2
8	7,01E+03	7,01E+03	1,42E+06	1,03E+09	2,57E+07	3,92E+09	4,56E+09	1,00E+00	1,25E+07	1,33E+03	1,73E+03	6,14E-03	5786,5	4607,8
9	7,59E+03	7,59E+03	1,29E+06	1,12E+09	2,41E+07	2,64E+09	2,66E+09	1,00E+00	1,64E+07	2,84E+03	2,71E+03	4,58E-03	6140,8	5035,6
10	5,41E+03	5,41E+03	2,61E+06	1,23E+09	3,97E+07	1,49E+09	4,38E+07	1,00E+00	9,76E+06	3,22E+04	3,77E+04	3,35E-03	10117,7	8597,7
11	9,56E+03	9,56E+03	3,49E+08	9,76E+08	2,71E+08	5,76E+08	1,37E+02	1,00E+00	1,00E+00	2,61E+08	8,42E+07	2,90E-03	9812,5	8288,7
12	9,49E+03	9,44E+03	2,47E+08	5,36E+08	1,51E+08	3,61E+08	1,22E+02	1,00E+00	1,76E+00	1,82E+08	6,25E+07	1,73E-03	9700,4	8065,5
13	9,43E+03	9,43E+03	1,78E+08	2,90E+08	8,25E+07	2,26E+08	2,36E+02	1,00E+00	1,34E+01	1,29E+08	4,80E+07	1,06E-03	9391,4	7913,8
14	9,00E+03	9,00E+03	1,19E+08	1,40E+08	4,05E+07	1,28E+08	4,51E+03	1,00E+00	8,27E+01	8,38E+07	3,46E+07	5,75E-04	8807,4	7383,2

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	7,14E+02	7,14E+02	6,05E+04	1,05E+11	1,14E+04	4,60E+11	5,00E+13	1,33E+13	1,08E+08	1,00E+00	1,00E+00	2,90E+00	324,6	324,6
2	1,01E+03	1,01E+03	3,93E+04	4,72E+09	3,95E+03	2,22E+11	1,15E+13	2,98E+12	8,38E+06	1,00E+00	1,00E+00	5,71E-01	249,3	281,2
3	1,22E+03	1,22E+03	8,30E+04	4,78E+03	4,20E+03	1,94E+11	3,16E+12	7,49E+11	2,45E+09	1,00E+00	1,17E+00	2,07E-01	391,3	365,3
4	1,92E+03	1,92E+03	5,92E+04	1,39E+04	2,23E+04	8,87E+10	4,20E+11	6,59E+10	4,30E+10	1,00E+00	2,42E+01	5,96E-02	848,9	713,8
5	2,02E+03	2,02E+03	6,26E+04	1,42E+04	2,43E+04	5,20E+10	1,85E+11	2,13E+10	3,25E+10	1,00E+00	6,94E+01	3,43E-02	1015,5	881,0
6	2,19E+03	2,19E+03	6,88E+04	1,36E+04	2,39E+04	2,81E+10	7,86E+10	6,25E+09	1,87E+10	1,00E+00	1,82E+02	1,95E-02	1278,0	1111,6
7	3,68E+03	3,68E+03	1,21E+05	5,47E+01	2,26E+04	1,51E+10	3,14E+10	8,79E+05	1,63E+09	1,00E+00	2,89E+02	1,32E-02	2378,4	2009,2
8	4,29E+03	4,29E+03	1,27E+06	7,05E+06	6,56E+06	5,04E+09	1,40E+05	1,00E+00	5,40E+06	1,71E+04	8,17E+04	8,81E-03	15652,4	12615,7
9	7,35E+03	7,35E+03	6,12E+08	6,02E+09	1,02E+09	1,57E+09	4,32E+00	1,00E+00	1,00E+00	3,35E+08	2,71E+08	6,02E-03	5302,0	4330,6
10	5,78E+03	5,78E+03	1,39E+09	3,20E+09	3,00E+08	8,39E+08	1,47E+00	1,00E+00	1,00E+00	8,86E+08	4,96E+08	4,65E-03	5349,6	4444,5
11	4,91E+03	4,91E+03	1,76E+09	1,47E+09	6,73E+07	4,46E+08	1,05E+00	1,00E+00	1,00E+00	1,21E+09	5,42E+08	3,11E-03	4501,5	3688,2
12	5,22E+03	5,22E+03	1,26E+09	5,61E+08	2,67E+07	2,46E+08	1,01E+00	1,00E+00	1,00E+00	8,82E+08	3,79E+08	2,09E-03	4903,4	3972,4
13	5,48E+03	5,48E+03	7,93E+08	1,58E+08	9,69E+06	9,98E+07	1,00E+00	1,00E+00	1,00E+00	5,50E+08	2,43E+08	1,24E-03	5215,3	4205,2
14	6,85E+03	6,85E+03	4,09E+08	5,26E+07	6,64E+06	5,23E+07	1,00E+00	1,00E+00	1,00E+00	2,65E+08	1,44E+08	7,75E-04	6653,8	5337,5

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 = 90,00 TDAT2 =120,00

K	TEL	TVIBN2	ENF	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	9,71E+02	9,71E+02	8,08E+04	5,71E+03	1,44E+04	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	1,16E+03	1,16E+03	4,17E+04	1,54E+03	6,11E+03	3,91E+11	1,38E+13	3,53E+12	2,41E+10	1,00E+00	1,00E+00	1,01E+00	447,9	412,5
3	1,51E+03	1,51E+03	5,96E+04	3,52E+03	6,61E+03	2,97E+11	6,15E+12	1,47E+12	4,23E+10	1,00E+00	1,00E+00	5,40E-01	491,1	491,2
4	2,13E+03	2,13E+03	1,01E+05	1,17E+04	3,56E+03	2,63E+11	1,46E+12	1,73E+10	3,58E+10	1,00E+00	1,14E+01	2,91E-01	1338,7	1187,2
5	3,30E+03	3,30E+03	3,24E+05	1,98E+06	6,87E+05	1,26E+11	1,93E+11	3,36E+00	2,60E+06	1,00E+00	2,59E+01	1,10E-01	3130,5	2501,3
6	3,69E+03	3,69E+03	1,03E+06	1,13E+07	2,54E+06	1,07E+11	1,34E+11	1,00E+00	2,97E+05	1,00E+00	3,77E+01	9,72E-02	3466,2	2917,6
7	4,03E+03	4,03E+03	9,21E+05	4,68E+07	2,76E+06	7,34E+10	8,31E+10	1,00E+00	6,08E+04	1,00E+00	4,40E+01	6,25E-02	3535,8	2891,9
8	4,43E+03	4,43E+03	1,03E+06	3,06E+08	3,77E+06	5,20E+10	5,27E+10	1,00E+00	5,63E+03	5,09E+00	5,88E+01	4,33E-02	3594,1	2986,1
9	4,92E+03	4,92E+03	1,70E+06	3,07E+09	8,51E+06	3,55E+10	2,49E+10	1,00E+00	1,46E+00	1,12E+02	1,25E+02	2,98E-02	4049,7	3398,0
10	4,98E+03	4,98E+03	3,37E+07	1,76E+10	1,31E+09	1,16E+10	1,12E+02	1,00E+00	1,07E+00	4,16E+05	1,41E+07	2,05E-02	5765,7	4844,7
11	5,91E+03	5,91E+03	1,32E+09	1,41E+10	1,94E+09	3,34E+09	1,02E+01	1,00E+00	1,00E+00	3,04E+08	1,00E+09	1,24E-02	4737,3	3420,2
12	5,11E+03	5,11E+03	3,22E+09	6,22E+09	3,25E+08	1,14E+09	1,54E+00	1,00E+00	1,00E+00	1,85E+09	1,37E+09	7,49E-03	4319,5	3538,3
13	4,55E+03	4,55E+03	2,65E+09	2,56E+09	9,02E+07	5,41E+08	1,09E+00	1,00E+00	1,00E+00	1,81E+09	8,41E+08	4,36E-03	4090,3	3306,1
14	4,14E+03	4,14E+03	1,92E+09	8,83E+08	1,93E+07	2,34E+08	1,01E+00	1,00E+00	1,00E+00	1,37E+09	5,53E+08	2,48E-03	3779,0	3020,2

AD-A043 546 GENERAL RESEARCH CORP SANTA BARBARA CALIF F/G 17/9
THE ROSCOE MANUAL. VOLUME 16. HIGH-ALTITUDE NEUTRAL-PARTICLE MO--ETC(U)
AUG 75 D A HAMLIN, C A SMITH, M R SCHOONOVER DNA001-74-C-0182
UNCLASSIFIED DNA-3964F-16 NL

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        OUTPUT FROM RKAM2G FOR COLUMN ( 1,  1) AND TIME =  150,0
KCYC=   14 TIMDEL= 3,700000E-02 TIMTOT= 1,838000E+00 TTX= 1,340800E+01

 K    ALTITUDE,CM   DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,107349E+09   1,687939E+00
 2   9,370020E+06   1,548069E-09  -4,490094E+01    9,989024E-01   1,122978E+09   8,692233E-01
 3   1,004190E+07   4,845764E-10  -2,895571E+02    1,016498E+00   1,275793E+09   3,091095E-01
 4   1,072633E+07   1,626362E-10  -8,627986E+02    1,029298E+00   1,451723E+09   1,180514E-01
 5   1,152489E+07   5,026940E-11  -2,132184E+03    1,019185E+00   1,871858E+09   4,704858E-02
 6   1,251218E+07   1,569550E-11  -3,060441E+03    9,767313E-01   2,708178E+09   2,152393E-02
 7   1,374557E+07   6,246985E-12  -1,905223E+03    9,474952E-01   3,727076E+09   1,164149E-02
 8   1,521016E+07   2,865361E-12   1,267114E+03    9,325685E-01   4,513488E+09   6,466387E-03
 9   1,705499E+07   1,283417E-12   5,303300E+03    8,862870E-01   5,722952E+09   3,672467E-03
10   1,970167E+07   5,446923E-13   1,704857E+04    8,287823E-01   7,359519E+09   2,004337E-03
11   2,332334E+07   1,908626E-13   4,073257E+04    8,629341E-01   1,297601E+10   1,238317E-03
12   2,962905E+07   5,427691E-14   6,036468E+04    9,094715E-01   1,664670E+10   4,517657E-04
13   3,944993E+07   1,359656E-14   9,600296E+04    8,528481E-01   2,780827E+10   1,890763E-04
14   5,683713E+07   3,019073E-15   1,881015E+05    8,227172E-01   3,549128E+10   5,357539E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=     2,40347E-02 CM, X=     1,22000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=     1,81524E-01 CM, X=     1,24000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=     1,32077E+00 CM, X=     1,28000E+02 SEC
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        OUTPUT FROM RKAM2G FOR COLUMN ( 2,  1) AND TIME =  150,0
KCYC=   14 TIMDEL= 3,800000E-02 TIMTOT= 1,876000E+00 TTX= 1,345500E+01

 K    ALTITUDE,CM   DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,113934E+09   1,697976E+00
 2   9,384638E+06   1,498406E-09  -2,017069E+02    1,016023E+00   1,140023E+09   8,541085E-01
 3   1,008066E+07   4,666609E-10  -8,935374E+02    1,056494E+00   1,351755E+09   3,154057E-01
 4   1,080623E+07   1,488584E-10  -2,997784E+03    1,061021E+00   1,455878E+09   1,083599E-01
 5   1,172316E+07   4,094771E-11  -6,147292E+03    9,990744E-01   2,078135E+09   4,254744E-02
 6   1,303869E+07   1,245112E-11  -5,243010E+03    9,218184E-01   3,146082E+09   1,958862E-02
 7   1,451867E+07   5,424981E-12   3,723695E+02    8,910931E-01   4,070370E+09   1,104084E-02
 8   1,614571E+07   2,487066E-12   8,108984E+03    8,582877E-01   4,934525E+09   6,136243E-03
 9   1,837672E+07   1,074293E-12   1,922149E+04    7,975572E-01   6,147473E+09   3,302093E-03
10   2,146632E+07   4,400169E-13   4,067180E+04    7,456369E-01   7,882830E+09   1,734289E-03
11   2,597124E+07   1,269548E-13   7,298487E+04    7,878330E-01   2,061610E+10   1,329272E-03
12   3,708845E+07   3,223578E-14   1,325345E+05    8,543280E-01   2,698849E+10   4,349974E-04
13   5,195097E+07   9,002664E-15   2,119136E+05    7,977831E-01   4,533936E+10   2,040875E-04
14   7,682661E+07   2,022057E-15   3,768737E+05    7,688844E-01   4,897316E+10   4,951325E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=     2,91439E-02 CM, X=     1,22000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=     2,29456E-01 CM, X=     1,24000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=     1,64405E+00 CM, X=     1,28000E+02 SEC
FOR COLUMN     3  REZONE NUMBER      1   REQUIRED AT TIME  1,500000E+02
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        OUTPUT FROM RKAM2G FOR COLUMN ( 3,  1) AND TIME =  150,0
KCYC=   14 TIMDEL= 3,800000E-02 TIMTOT= 1,914000E+00 TTX= 1,350100E+01

 K    ALTITUDE,CM   DENSITY,G/CM3   VEL,,CM/SEC     DEN, RATIO     INT, E,,ERG/G  PRESS,,D/CM2

 1   9,000000E+06   3,048612E-09   0,              1,000000E+00   1,148970E+09   1,751382E+00
 2   9,437839E+06   1,401434E-09  -4,505786E+02    1,047943E+00   1,185658E+09   8,308103E-01
 3   1,014633E+07   4,248204E-10  -2,344656E+03    1,101214E+00   1,437101E+09   3,052549E-01
 4   1,101923E+07   1,182234E-10  -6,885362E+03    1,065874E+00   1,633930E+09   9,658438E-02
 5   1,221958E+07   2,941884E-11  -9,592707E+03    9,464600E-01   2,684739E+09   3,949095E-02
 6   1,414928E+07   8,856515E-12   1,543788E+02    8,170722E-01   3,813739E+09   1,688822E-02
 7   1,607605E+07   3,884819E-12   1,303732E+04    7,772061E-01   4,411156E+09   8,568271E-03
 8   1,847410E+07   1,613285E-12   3,035734E+04    7,491355E-01   5,658008E+09   4,563989E-03
 9   2,186279E+07   6,878246E-13   5,765843E+04    7,220127E-01   7,196145E+09   2,474843E-03
10   2,652985E+07   2,854515E-13   9,314212E+04    7,889567E-01   1,143025E+10   1,631391E-03
11   3,345216E+07   7,514921E-14   1,058361E+05    8,390881E-01   4,668398E+10   1,754132E-03
12   5,727120E+07   1,485101E-14   3,104026E+05    7,528497E-01   5,260814E+10   3,906419E-04
13   8,483514E+07   5,013071E-15   4,929901E+05    7,457436E-01   7,780341E+10   1,950170E-04
14   1,198150E+08   1,272453E-15   7,529312E+05    7,208238E-01   6,948140E+10   4,420590E-05
TIME STEP IS DOUBLED, IHLF=    0, H=    1,00000E+00 SEC, DELT=     3,95170E-02 CM, X=     1,22000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -1, H=    2,00000E+00 SEC, DELT=     3,02775E-01 CM, X=     1,24000E+02 SEC
TIME STEP IS DOUBLED, IHLF=   -2, H=    4,00000E+00 SEC, DELT=     1,98951E+00 CM, X=     1,32000E+02 SEC
```

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 150.0
KCYC= 15 TIMDEL= 4.000000E-02 TIMTOT= 1.954000E+00 TTX= 1.355000E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	1.262018E+09	1.923701E+00
2	9.612797E+06	1.175282E-09	-3.328921E+02	1.077581E+00	1.316974E+09	7.739080E-01
3	1.060418E+07	2.232709E-10	-6.019892E+03	1.053628E+00	1.717254E+09	1.917064E-01
4	1.300186E+07	2.973347E-11	-3.642387E+03	8.710057E-01	2.833361E+09	4.212282E-02
5	1.627778E+07	8.890671E-12	8.853392E+03	8.458800E-01	4.306437E+09	1.915245E-02
6	2.006271E+07	3.233598E-12	3.176597E+04	7.647383E-01	6.429214E+09	1.039475E-02
7	2.642624E+07	5.158854E-13	9.703661E+04	6.966204E-01	2.117187E+10	5.461130E-03
8	3.431158E+07	2.437385E-13	1.622021E+05	7.295436E-01	3.140543E+10	3.827356E-03
9	4.324092E+07	1.574028E-13	2.332287E+05	7.432607E-01	3.730386E+10	2.935865E-03
10	5.308355E+07	8.568238E-14	3.083131E+05	7.299998E-01	4.877478E+10	2.089570E-03
11	6.453014E+07	3.516367E-14	4.139254E+05	6.944693E-01	9.535535E+10	1.676522E-03
12	7.904169E+07	2.199609E-14	5.498053E+05	7.140122E-01	9.485145E+10	1.043181E-03
13	9.339112E+07	1.379642E-14	6.534937E+05	7.387788E-01	9.740717E+10	6.719352E-04
14	1.094764E+08	7.514036E-15	7.664563E+05	7.329875E-01	9.606791E+10	3.610040E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1.00000E+00 SEC, DELT= 1.78595E-02 CM, X= 1.22000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2.00000E+00 SEC, DELT= 1.38365E-01 CM, X= 1.24000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4.00000E+00 SEC, DELT= 8.94128E-01 CM, X= 1.28000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 150.0
KCYC= 14 TIMDEL= 3.800000E-02 TIMTOT= 1.992000E+00 TTX= 1.359600E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	1.903376E+09	2.901328E+00
2	9.629117E+06	1.438386E-09	2.395349E+03	9.346457E-01	1.713311E+09	1.232201E+00
3	1.079242E+07	4.069435E-10	-1.047118E+03	1.026716E+00	1.866020E+09	3.800894E-01
4	1.259468E+07	1.029820E-10	-2.711902E+03	8.761696E-01	2.431278E+09	1.251889E-01
5	1.544515E+07	2.675386E-11	1.494671E+04	7.879877E-01	3.699469E+09	4.948752E-02
6	1.877869E+07	1.374220E-11	3.277677E+04	8.076319E-01	4.763344E+09	3.272941E-02
7	2.278145E+07	7.588620E-12	5.843268E+04	7.955841E-01	5.719051E+09	2.169985E-02
8	2.740465E+07	4.065963E-12	8.784004E+04	7.920624E-01	7.022652E+09	1.427692E-02
9	3.296304E+07	1.900989E-12	1.247355E+05	7.669368E-01	1.043595E+10	9.919311E-03
10	4.015734E+07	7.843467E-13	1.818447E+05	7.320809E-01	1.757840E+10	6.893781E-03
11	4.880201E+07	3.404077E-13	2.546228E+05	7.239360E-01	3.000248E+10	5.106538E-03
12	5.868391E+07	2.021591E-13	3.336338E+05	7.318069E-01	4.003750E+10	4.046974E-03
13	6.964618E+07	1.397932E-13	4.171247E+05	7.372710E-01	4.752282E+10	3.321684E-03
14	8.182174E+07	9.799860E-14	5.080813E+05	7.342572E-01	5.331068E+10	2.612186E-03

TIME STEP IS DOUBLED, IHLF= 0, H= 1.00000E+00 SEC, DELT= 5.41508E-02 CM, X= 1.22000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2.00000E+00 SEC, DELT= 3.57962E-01 CM, X= 1.24000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4.00000E+00 SEC, DELT= 1.96536E+00 CM, X= 1.28000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 150.0
KCYC= 14 TIMDEL= 3.800000E-02 TIMTOT= 2.030000E+00 TTX= 1.364200E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN. RATIO	INT. E.,ERG/G	PRESS.,D/CM2
1	9.000000E+06	3.048612E-09	0.	1.000000E+00	3.827243E+09	5.833884E+00
2	9.788912E+06	1.526995E-09	7.475673E+03	7.624399E-01	2.871750E+09	2.192573E+00
3	1.112848E+07	7.735315E-10	1.087803E+04	1.033050E+00	2.508334E+09	9.701375E-01
4	1.267525E+07	2.368372E-10	4.385099E+03	9.409760E-01	3.516178E+09	4.163808E-01
5	1.565893E+07	4.174154E-11	2.812386E+04	7.134067E-01	7.072195E+09	1.476022E-01
6	1.942685E+07	1.492599E-11	5.922664E+04	7.311659E-01	1.303272E+10	9.726315E-02
7	2.363346E+07	6.762351E-12	8.845881E+04	7.877393E-01	2.226179E+10	7.527104E-02
8	2.812461E+07	5.410124E-12	1.147173E+05	7.802103E-01	2.545371E+10	6.885386E-02
9	3.406115E+07	3.954799E-12	1.648268E+05	7.322862E-01	2.593170E+10	5.127732E-02
10	4.126129E+07	2.992676E-12	2.199708E+05	7.453900E-01	2.618636E+10	3.918365E-02
11	4.956827E+07	2.242696E-12	2.797037E+05	7.539039E-01	2.718245E+10	3.048101E-02
12	5.909760E+07	1.601129E-12	3.478362E+05	7.535612E-01	2.858543E+10	2.288448E-02
13	6.982948E+07	1.110987E-12	4.230296E+05	7.511114E-01	3.016648E+10	1.675728E-02
14	8.182618E+07	7.134198E-13	5.073350E+05	7.458547E-01	3.303005E+10	1.178215E-02

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3.49E+02	3,49E+02	2,26E+04	1,12E+09	4,24E+03	2,27E+11	5,01E+13	1,34E+13	9,79E+06	1,00E+00	1,00E+00	1,69E+00	191,8	191,8
2	4.12E+02	4,12E+02	3,94E+04	6,76E+08	5,73E+03	3,07E+11	2,54E+13	6,72E+12	3,94E+07	1,00E+00	1,00E+00	8,69E-01	194,1	194,0
3	5.40E+02	5,40E+02	1,59E+05	6,18E+08	7,43E+04	4,06E+11	7,96E+12	1,95E+12	4,76E+07	1,00E+00	1,93E+00	3,09E-01	215,3	217,0
4	5.96E+02	5,96E+02	1,75E+05	2,51E+08	8,17E+04	2,91E+11	2,67E+12	5,77E+11	1,32E+08	1,00E+00	1,58E+01	1,18E-01	238,1	241,6
5	6.38E+02	6,38E+02	1,77E+05	1,44E+08	7,82E+04	1,25E+11	8,25E+11	1,61E+11	1,63E+08	1,00E+00	8,22E+01	4,71E-02	303,6	306,5
6	7.42E+02	7,42E+02	1,62E+05	1,09E+08	5,62E+04	4,48E+10	2,61E+11	4,83E+10	1,67E+08	1,00E+00	2,57E+02	2,16E-02	445,3	440,0
7	7.98E+02	7,98E+02	1,50E+05	7,48E+07	4,57E+04	2,29E+10	1,02E+11	1,70E+10	1,48E+08	1,00E+00	8,25E+02	1,17E-02	610,7	594,5
8	6.93E+02	6,93E+02	1,48E+05	3,51E+07	5,75E+04	1,33E+10	4,59E+10	7,02E+09	7,12E+07	1,00E+00	2,87E+03	6,47E-03	731,1	706,0
9	7.72E+02	7,72E+02	1,72E+05	2,70E+07	1,15E+05	7,56E+09	2,01E+10	2,77E+09	5,35E+07	1,50E+00	1,09E+04	3,68E-03	926,2	872,9
10	9.30E+02	9,30E+02	3,35E+05	2,34E+07	1,31E+06	4,20E+09	8,14E+09	9,93E+08	3,40E+07	1,14E+01	1,50E+05	2,01E-03	1190,8	1084,1
11	1.93E+03	1,93E+03	1,94E+06	5,56E+07	1,00E+07	2,08E+09	2,60E+09	2,32E+08	2,71E+07	3,67E+02	1,66E+06	1,25E-03	1929,9	1792,8
12	2.72E+03	2,72E+03	3,71E+06	3,37E+07	8,29E+06	8,16E+08	6,28E+08	4,06E+07	5,02E+06	3,97E+04	3,46E+06	4,55E-04	2223,9	2120,9
13	4.24E+03	4,24E+03	9,47E+06	2,00E+07	2,97E+06	2,80E+08	1,12E+08	3,24E+06	5,97E+05	4,56E+06	4,83E+06	1,92E-04	3349,6	3093,3
14	3.98E+03	3,98E+03	5,96E+06	3,45E+06	7,47E+05	7,77E+07	1,43E+07	5,71E+05	1,73E+05	2,35E+06	3,60E+06	5,39E-05	3864,8	3505,5

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3.60E+02	3,60E+02	2,34E+04	1,80E+09	4,36E+03	2,28E+11	5,01E+13	1,34E+13	1,01E+06	1,00E+00	1,00E+00	1,70E+00	193,0	193,0
2	4.63E+02	4,63E+02	4,23E+04	2,54E+09	5,33E+03	3,03E+11	2,46E+13	6,50E+12	1,15E+05	1,00E+00	1,00E+00	8,54E-01	195,3	196,9
3	6.22E+02	6,22E+02	1,71E+05	2,16E+09	7,34E+04	3,96E+11	7,66E+12	1,87E+12	4,23E+05	1,00E+00	2,05E+00	3,15E-01	223,7	229,9
4	6.21E+02	6,21E+02	1,74E+05	2,84E+08	7,48E+04	2,68E+11	2,44E+12	5,27E+11	1,14E+08	1,00E+00	1,62E+01	1,08E-01	235,1	242,2
5	7.46E+02	7,46E+02	1,71E+05	1,76E+08	6,03E+04	1,05E+11	6,72E+11	1,29E+11	1,53E+08	1,00E+00	8,78E+01	4,26E-02	339,8	339,6
6	8.94E+02	8,94E+02	1,50E+05	9,24E+07	4,18E+04	3,69E+10	2,04E+11	3,69E+10	2,37E+08	1,00E+00	2,70E+02	1,97E-02	530,6	509,4
7	8.50E+02	8,50E+02	1,36E+05	6,05E+07	3,86E+04	2,07E+10	8,83E+10	1,44E+10	1,99E+08	1,00E+00	8,45E+02	1,11E-02	685,6	647,2
8	8.19E+02	8,19E+02	1,40E+05	3,92E+07	4,59E+04	1,19E+10	3,99E+10	5,90E+09	1,22E+08	1,00E+00	2,88E+03	6,15E-03	830,2	769,1
9	9.54E+02	9,54E+02	1,59E+05	2,90E+07	7,58E+04	6,52E+09	1,68E+10	2,21E+09	9,74E+07	1,96E+00	9,61E+03	3,31E-03	1045,5	933,7
10	1.20E+03	1,20E+03	2,91E+05	3,07E+07	1,04E+06	3,49E+09	6,56E+09	7,48E+08	6,77E+07	1,80E+01	1,18E+05	1,74E-03	1336,9	1154,5
11	3.54E+03	3,54E+03	7,26E+05	9,14E+07	1,34E+07	1,59E+09	1,71E+09	6,90E+07	4,65E+07	1,17E+03	3,37E+05	1,35E-03	3088,6	2741,5
12	5.01E+03	5,01E+03	5,75E+06	6,83E+07	8,54E+06	5,30E+08	3,44E+08	5,12E+06	2,56E+06	3,30E+06	2,21E+06	4,41E-04	3498,1	3233,3
13	5.41E+03	5,41E+03	1,63E+07	3,51E+07	3,36E+06	1,87E+08	5,96E+07	4,03E+05	4,31E+05	1,02E+07	5,98E+06	2,06E-04	5147,7	4597,8
14	4.82E+03	4,82E+03	6,91E+06	4,38E+06	7,74E+05	5,06E+07	7,83E+06	2,50E+05	3,63E+05	2,76E+06	4,13E+06	4,96E-05	5195,7	4555,3

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4.05E+02	4,05E+02	2,68E+04	7,71E+09	4,81E+03	2,37E+11	5,01E+13	1,34E+13	1,47E+05	1,00E+00	1,00E+00	1,75E+00	199,0	199,0
2	5.50E+02	5,50E+02	4,73E+04	1,07E+10	3,93E+03	2,93E+11	2,30E+13	6,08E+12	8,75E+04	1,00E+00	1,00E+00	8,31E-01	200,0	204,7
3	7.19E+02	7,19E+02	1,80E+05	5,56E+09	6,77E+04	3,66E+11	6,97E+12	1,70E+12	3,27E+05	1,00E+00	2,20E+00	3,05E-01	232,8	244,3
4	7.51E+02	7,51E+02	1,72E+05	8,43E+08	5,70E+04	2,20E+11	1,94E+12	4,15E+11	1,09E+07	1,00E+00	1,76E+01	9,66E-02	262,9	271,4
5	9.45E+02	9,45E+02	1,56E+05	1,65E+08	4,18E+04	8,13E+10	4,83E+11	9,01E+10	1,90E+08	1,00E+00	9,79E+01	3,96E-02	448,9	436,7
6	1.06E+03	1,06E+03	1,20E+05	9,57E+06	2,71E+04	2,89E+10	1,45E+11	2,49E+10	6,58E+08	1,00E+00	2,85E+02	1,69E-02	677,9	612,8
7	9.16E+02	9,16E+02	1,03E+05	1,38E+07	2,00E+04	1,58E+10	6,32E+10	9,73E+09	3,70E+08	1,00E+00	8,54E+02	8,59E-03	790,2	696,7
8	1.12E+03	1,12E+03	1,09E+05	8,10E+06	1,71E+04	8,37E+09	2,58E+10	3,46E+09	3,51E+08	1,00E+00	2,57E+03	4,57E-03	1007,4	871,9
9	1.42E+03	1,42E+03	1,27E+05	7,98E+06	3,42E+04	4,53E+09	1,07E+10	1,21E+09	3,05E+08	1,03E+00	7,28E+03	2,49E-03	1264,7	1074,6
10	2.18E+03	2,18E+03	2,05E+05	1,47E+07	9,33E+04	2,57E+09	4,23E+09	3,18E+08	2,45E+08	1,45E+01	2,84E+04	1,64E-03	1816,5	1613,5
11	7.55E+03	7,55E+03	9,42E+05	5,12E+08	2,80E+07	1,09E+09	8,23E+08	1,00E+00	3,01E+07	1,20E+04	1,99E+04	1,82E-03	5592,2	5122,5
12	6.29E+03	6,29E+03	1,30E+07	1,72E+08	2,59E+07	2,50E+08	8,79E+07	1,00E+00	1,10E+06	1,08E+07	2,03E+06	3,94E-04	5777,2	5012,7
13	6.64E+03	6,64E+03	1,95E+07	5,67E+07	1,02E+07	9,90E+07	1,18E+07	5,95E+01	1,34E+06	1,13E+07	8,16E+06	1,98E-04	7534,4	6506,5
14	5.90E+03	5,90E+03	7,50E+06	5,20E+06	1,04E+06	2,99E+07	2,96E+06	7,15E+04	8,96E+05	2,93E+06	4,54E+06	4,46E-05	6861,5	5825,5

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,87E+02	4,87E+02	3,31E+04	3,93E+10	5,69E+03	2,62E+11	5,00E+13	1,34E+13	6,55E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	7,15E+02	7,15E+02	5,25E+04	3,97E+10	1,99E+03	2,62E+11	1,93E+13	5,09E+12	3,38E+05	1,00E+00	1,00E+00	7,74E-01	218,8	227,2
3	9,13E+02	9,13E+02	1,08E+05	5,74E+09	4,19E+04	2,49E+11	3,66E+12	8,55E+11	1,71E+06	1,00E+00	4,03E+00	1,92E-01	283,3	290,8
4	1,22E+03	1,22E+03	1,16E+05	5,75E+04	1,51E+04	7,90E+10	4,98E+11	9,03E+10	6,65E+08	1,00E+00	4,56E+01	4,21E-02	497,1	463,9
5	1,27E+03	1,27E+03	1,04E+05	9,42E+03	1,56E+04	3,24E+10	1,46E+11	2,29E+10	3,45E+09	1,00E+00	2,04E+02	1,92E-02	740,2	680,7
6	1,36E+03	1,36E+03	9,39E+04	1,35E+04	1,60E+04	1,53E+10	5,25E+10	6,70E+09	1,95E+09	1,00E+00	7,71E+02	1,04E-02	1133,1	990,9
7	5,26E+03	5,26E+03	2,94E+05	3,60E+07	2,66E+06	4,94E+09	7,69E+09	3,21E+02	9,05E+07	3,61E+01	1,41E+03	5,47E-03	3720,8	3105,5
8	7,01E+03	7,01E+03	8,31E+05	7,45E+08	1,88E+07	2,87E+09	3,33E+09	1,00E+00	5,81E+06	2,52E+03	2,01E+03	3,85E-03	4657,0	3977,7
9	7,58E+03	7,58E+03	7,68E+05	8,22E+08	1,79E+07	1,97E+09	1,99E+09	1,00E+00	7,18E+06	4,51E+03	3,00E+03	2,96E-03	5139,6	4431,0
10	4,68E+03	4,68E+03	1,22E+06	8,99E+08	2,87E+07	1,09E+09	3,58E+07	1,00E+00	5,96E+06	3,24E+04	4,47E+04	2,10E-03	8606,1	7353,0
11	8,03E+03	8,03E+03	2,40E+08	7,03E+08	1,67E+08	3,99E+08	4,17E+01	1,00E+00	1,00E+00	1,78E+08	6,05E+07	1,68E-03	8126,3	6772,0
12	7,96E+03	7,96E+03	1,75E+08	3,99E+08	9,33E+07	2,57E+08	5,17E+01	1,00E+00	1,00E+00	1,29E+08	4,56E+07	1,04E-03	7860,5	6642,0
13	7,92E+03	7,92E+03	1,31E+08	2,25E+08	5,15E+07	1,67E+08	1,33E+02	1,00E+00	1,24E+00	9,46E+07	3,59E+07	6,73E-04	7710,7	6627,5
14	7,59E+03	7,59E+03	8,68E+07	1,09E+08	2,39E+07	9,40E+07	2,88E+03	1,00E+00	1,76E+01	6,12E+07	2,55E+07	3,61E-04	7249,1	6206,3

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6,65E+02	6,65E+02	4,64E+04	8,57E+10	7,47E+03	4,79E+11	5,00E+13	1,33E+13	1,23E+08	1,00E+00	1,00E+00	2,94E+00	328,8	328,8
2	8,14E+02	8,14E+02	3,83E+04	2,23E+10	4,55E+03	3,07E+11	2,36E+13	6,21E+12	2,29E+07	1,00E+00	1,00E+00	1,23E+00	306,1	296,0
3	1,09E+03	1,09E+03	5,84E+04	1,02E+07	3,20E+03	2,15E+11	6,68E+12	1,67E+12	1,01E+08	1,00E+00	1,00E+00	3,80E-01	317,2	321,4
4	1,39E+03	1,39E+03	7,91E+04	2,78E+03	5,90E+03	1,40E+11	1,69E+12	3,62E+11	4,95E+09	1,00E+00	2,69E+00	1,25E-01	441,4	413,1
5	1,82E+03	1,82E+03	6,08E+04	3,32E+02	3,00E+02	7,78E+10	4,37E+11	7,25E+10	2,90E+10	1,00E+00	1,69E+01	4,95E-02	662,0	587,7
6	1,97E+03	1,97E+03	6,32E+04	1,00E+00	1,00E+00	5,47E+10	2,24E+11	3,00E+10	3,73E+10	1,00E+00	4,20E+01	3,27E-02	779,2	700,2
7	2,05E+03	2,05E+03	5,82E+04	4,92E+02	1,00E+00	3,65E+10	1,23E+11	1,32E+10	2,90E+10	1,00E+00	8,34E+01	2,17E-02	899,1	802,0
8	2,18E+03	2,18E+03	5,61E+04	1,17E+03	8,57E+02	2,32E+10	6,59E+10	5,38E+09	1,94E+10	1,00E+00	1,66E+02	1,43E-02	1058,0	941,6
9	3,26E+03	3,26E+03	7,12E+04	3,59E+03	1,00E+00	1,38E+10	3,13E+10	8,48E+06	3,27E+09	1,00E+00	2,67E+02	9,92E-03	1722,9	1508,8
10	3,68E+03	3,68E+03	2,05E+05	5,05E+07	1,78E+05	6,69E+09	3,79E+07	1,33E+03	1,74E+08	2,21E+00	1,27E+04	6,76E-03	8436,1	7218,1
11	4,29E+03	4,29E+03	1,37E+06	1,58E+07	1,10E+07	3,03E+09	3,67E+03	1,00E+00	4,66E+05	5,34E+04	2,30E+05	5,11E-03	14220,5	12099,5
12	9,39E+03	9,39E+03	8,72E+07	1,32E+09	2,78E+08	1,40E+09	1,81E+01	1,00E+00	3,59E+00	3,70E+07	4,54E+07	4,09E-03	10687,6	9142,8
13	5,81E+03	5,81E+03	6,86E+08	3,25E+09	3,29E+08	8,26E+08	1,74E+00	1,00E+00	1,00E+00	4,01E+08	2,83E+08	3,34E-03	4615,8	3963,3
14	5,06E+03	5,06E+03	1,07E+09	1,96E+09	9,06E+07	5,13E+08	1,15E+00	1,00E+00	1,00E+00	6,90E+08	3,79E+08	2,62E-03	4019,8	3787,3

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 =120,00 TDAT2 =150,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	9,08E+02	9,08E+02	6,22E+04	3,91E+03	9,32E+03	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	9,84E+02	9,84E+02	4,05E+04	1,17E+03	3,16E+03	6,36E+11	2,51E+13	6,45E+12	2,13E+10	1,00E+00	1,00E+00	2,19E+00	565,0	493,3
3	1,18E+03	1,18E+03	4,01E+04	1,89E+03	3,28E+03	3,88E+11	1,27E+13	3,22E+12	2,61E+10	1,00E+00	1,00E+00	9,70E-01	423,2	430,2
4	1,67E+03	1,67E+03	5,64E+04	3,81E+03	7,46E+03	2,70E+11	3,91E+12	4,12E+11	4,04E+10	1,00E+00	1,00E+00	4,16E-01	671,0	650,9
5	2,33E+03	2,33E+03	7,42E+04	1,69E+01	1,09E+04	1,65E+11	7,31E+11	2,39E+08	6,66E+09	1,00E+00	1,37E+01	1,48E-01	1405,2	1186,9
6	2,88E+03	2,88E+03	1,24E+05	2,35E+05	8,93E+04	1,20E+11	2,90E+11	6,94E+03	7,69E+07	1,00E+00	2,00E+01	9,73E-02	2009,9	1718,6
7	3,37E+03	3,37E+03	3,56E+05	2,20E+06	6,02E+05	9,64E+10	1,42E+11	2,12E+00	1,74E+06	1,00E+00	3,36E+01	7,53E-02	2575,2	2285,6
8	3,60E+03	3,60E+03	5,99E+05	6,13E+06	1,36E+06	8,68E+10	1,13E+11	1,02E+00	4,76E+05	1,00E+00	3,90E+01	6,89E-02	2822,4	2493,0
9	3,82E+03	3,82E+03	6,09E+05	1,46E+07	1,85E+06	6,78E+10	8,14E+10	1,00E+00	1,57E+05	1,00E+00	4,22E+01	5,13E-02	2908,5	2488,9
10	4,06E+03	4,06E+03	5,83E+05	4,01E+07	2,05E+06	5,34E+10	6,00E+10	1,00E+00	4,92E+04	1,00E+00	4,98E+01	3,92E-02	2899,2	2503,1
11	4,35E+03	4,35E+03	6,28E+05	1,59E+08	2,63E+06	4,20E+10	4,35E+10	1,00E+00	7,71E+03	3,58E+00	6,09E+01	3,05E-02	2969,6	2578,4
12	4,71E+03	4,71E+03	8,73E+05	8,63E+08	4,72E+06	3,15E+10	2,59E+10	1,00E+00	2,23E+01	3,31E+01	9,74E+01	2,29E-02	3276,2	2844,0
13	3,32E+03	3,32E+03	5,70E+06	4,58E+09	4,64E+07	1,72E+10	9,84E+05	1,00E+00	1,42E+00	1,88E+03	1,34E+04	1,68E-02	6415,6	5560,1
14	5,78E+03	5,78E+03	3,93E+07	1,26E+10	1,01E+09	6,53E+09	5,47E+01	1,00E+00	1,00E+00	1,11E+06	2,79E+07	1,18E-02	4898,8	4230,7

OUTPUT FROM RKAM2G FOR COLUMN (1, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,700000E-02 TIMTOT= 2,067000E+00 TTX= 1,384400E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,107374E+09	1,687978E+00
2	9,368800E+06	1,568040E-09	-1,029235E+02	1,012901E+00	1,130301E+09	8,861784E-01
3	1,002710E+07	4,943901E-10	-5,266308E+02	1,020252E+00	1,288989E+09	3,166316E-01
4	1,069986E+07	1,680564E-10	-9,018390E+02	1,033327E+00	1,476824E+09	1,240948E-01
5	1,146336E+07	5,295668E-11	-1,679821E+03	1,053458E+00	1,923761E+09	5,093800E-02
6	1,240013E+07	1,640408E-11	-3,729259E+03	1,031995E+00	2,757469E+09	2,261687E-02
7	1,363114E+07	6,091230E-12	-5,311707E+03	9,750673E-01	3,690231E+09	1,123902E-02
8	1,517838E+07	2,691873E-12	-3,644762E+03	9,394533E-01	4,379781E+09	5,894907E-03
9	1,714320E+07	1,171933E-12	4,788425E+02	9,131352E-01	5,476523E+09	3,209060E-03
10	2,009992E+07	4,671583E-13	9,366437E+03	8,576555E-01	6,838098E+09	1,597237E-03
11	2,443258E+07	1,608548E-13	3,223125E+04	8,427784E-01	1,205998E+10	9,699531E-04
12	3,156189E+07	4,785466E-14	6,716925E+04	8,816762E-01	1,574625E+10	3,767658E-04
13	4,246022E+07	1,178773E-14	1,039736E+05	8,668366E-01	2,631214E+10	1,550803E-04
14	6,265477E+07	2,529740E-15	1,985032E+05	8,379194E-01	3,265463E+10	4,130386E-05

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 1,02256E-02 CM, X= 1,52000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 7,78861E-02 CM, X= 1,54000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4,00000E+00 SEC, DELT= 5,67633E-01 CM, X= 1,58000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (2, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,700000E-02 TIMTOT= 2,104000E+00 TTX= 1,388900E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,113939E+09	1,697984E+00
2	9,378302E+06	1,532338E-09	-1,335879E+02	1,022645E+00	1,152861E+09	8,832861E-01
3	1,005659E+07	4,904800E-10	-6,922357E+02	1,051042E+00	1,385843E+09	3,398641E-01
4	1,073376E+07	1,661937E-10	-1,569853E+03	1,116455E+00	1,539512E+09	1,279286E-01
5	1,153230E+07	4,521985E-11	-5,146554E+03	1,104332E+00	2,187545E+09	4,946023E-02
6	1,279639E+07	1,216506E-11	-9,935160E+03	9,770252E-01	3,120843E+09	1,898262E-02
7	1,442823E+07	4,764807E-12	-6,602022E+03	8,783084E-01	3,827749E+09	9,119242E-03
8	1,631022E+07	2,137997E-12	1,979674E+03	8,596463E-01	4,586478E+09	4,902938E-03
9	1,886327E+07	9,158075E-13	1,260105E+04	8,524746E-01	5,692592E+09	2,606659E-03
10	2,251815E+07	3,667057E-13	2,886631E+04	8,333900E-01	7,239532E+09	1,327389E-03
11	2,785012E+07	1,065138E-13	5,247548E+04	8,259783E-01	1,909619E+10	1,017004E-03
12	4,120438E+07	2,655540E-14	1,399716E+05	8,237865E-01	2,481467E+10	3,294817E-04
13	5,647291E+07	7,400509E-15	2,217275E+05	8,220355E-01	4,151282E+10	1,536080E-04
14	8,836095E+07	1,608176E-15	3,905052E+05	7,953170E-01	4,390455E+10	3,530312E-05

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 2,16722E-02 CM, X= 1,52000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,77007E-01 CM, X= 1,54000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4,00000E+00 SEC, DELT= 1,43995E+00 CM, X= 1,58000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (3, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,700000E-02 TIMTOT= 2,141000E+00 TTX= 1,393500E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,148972E+09	1,751386E+00
2	9,483953E+06	1,375373E-09	-3,906022E+02	1,089753E+00	1,258792E+09	8,656541E-01
3	1,058421E+07	1,952307E-10	-4,599979E+03	1,113043E+00	1,657234E+09	1,617715E-01
4	1,221517E+07	2,434257E-11	-1,000244E+04	9,851529E-01	2,810394E+09	3,420611E-02
5	1,473940E+07	5,835672E-12	-5,132291E+03	8,519425E-01	3,690013E+09	1,076685E-02
6	1,805161E+07	1,873991E-12	1,265266E+04	8,128762E-01	4,621359E+09	4,330192E-03
7	2,201073E+07	7,386429E-13	3,461234E+04	8,116681E-01	6,011771E+09	2,220276E-03
8	2,653165E+07	3,555450E-13	5,702859E+04	8,496549E-01	8,669598E+09	1,541216E-03
9	3,155154E+07	1,537923E-13	7,313135E+04	8,674193E-01	1,789823E+10	1,376305E-03
10	3,793235E+07	5,546919E-14	1,157650E+05	7,926929E-01	4,320341E+10	1,198229E-03
11	4,642142E+07	3,375865E-14	1,874452E+05	7,509299E-01	4,314270E+10	7,282196E-04
12	5,584242E+07	2,093272E-14	2,515017E+05	7,758261E-01	4,516958E+10	4,727610E-04
13	6,633028E+07	1,201209E-14	3,122010E+05	7,940453E-01	4,725599E+10	2,838217E-04
14	7,761545E+07	8,321957E-15	3,687574E+05	8,060935E-01	5,440462E+10	2,263764E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 1,08646E-02 CM, X= 1,52000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 8,43804E-02 CM, X= 1,54000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4,00000E+00 SEC, DELT= 7,05818E-01 CM, X= 1,58000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (4, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,800000E-02 TIMTOT= 2,179000E+00 TTX= 1,398200E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0,	1,000000E+00	1,262069E+09	1,923779E+00
2	9,484036E+06	1,507543E-09	-7,193105E+02	1,076293E+00	1,355677E+09	1,021871E+00
3	1,060765E+07	2,202312E-10	-2,856252E+03	1,115056E+00	1,869697E+09	2,058829E-01
4	1,220477E+07	4,642533E-11	-1,464750E+04	1,023856E+00	2,581779E+09	5,992997E-02
5	1,461201E+07	1,403957E-11	-1,218686E+04	8,992864E-01	3,360358E+09	2,358899E-02
6	1,775650E+07	5,392419E-12	7,339096E+02	8,393531E-01	4,480891E+09	1,210299E-02
7	2,170868E+07	2,072026E-12	2,495521E+04	7,772507E-01	6,426955E+09	6,658410E-03
8	2,663545E+07	6,758811E-13	6,411249E+04	7,503512E-01	1,279234E+10	4,323050E-03
9	3,239342E+07	3,124605E-13	1,065628E+05	7,736182E-01	2,124691E+10	3,319410E-03
10	3,923413E+07	1,894203E-13	1,512229E+05	7,843497E-01	2,805059E+10	2,656676E-03
11	4,729041E+07	1,370162E-13	2,034799E+05	7,800079E-01	3,179375E+10	2,178129E-03
12	5,661302E+07	8,755544E-14	2,668219E+05	7,698301E-01	3,803384E+10	1,665035E-03
13	6,730494E+07	4,741906E-14	3,419017E+05	7,505921E-01	5,337576E+10	1,265514E-03
14	7,953892E+07	2,426532E-14	4,354798E+05	7,354439E-01	8,185420E+10	9,931092E-04

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 9,39102E-03 CM, X= 1,52000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 6,98095E-02 CM, X= 1,54000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4,00000E+00 SEC, DELT= 4,75623E-01 CM, X= 1,58000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (5, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,700000E-02 TIMTOT= 2,216000E+00 TTX= 1,402700E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	1,926609E+09	2,936742E+00
2	9,698163E+06	1,481279E-09	4,961801E+02	1,029820E+00	1,741037E+09	1,289481E+00
3	1,070874E+07	4,601174E-10	-3,480607E+03	1,130667E+00	1,986331E+09	4,569727E-01
4	1,236322E+07	1,015222E-10	-1,198467E+04	9,858249E-01	2,413986E+09	1,225366E-01
5	1,562591E+07	2,303520E-11	-3,112420E+03	8,610048E-01	3,432760E+09	3,953715E-02
6	1,944514E+07	1,161250E-11	1,157734E+04	8,450252E-01	4,378738E+09	2,542406E-02
7	2,423674E+07	6,240928E-12	3,830010E+04	8,224062E-01	5,186459E+09	1,618416E-02
8	2,975254E+07	3,333292E-12	6,842698E+04	8,198039E-01	6,358613E+09	1,059756E-02
9	3,646714E+07	1,519977E-12	1,073017E+05	7,995718E-01	9,332595E+09	7,092664E-03
10	4,538316E+07	6,093792E-13	1,661225E+05	7,769258E-01	1,520037E+10	4,631396E-03
11	5,621190E+07	2,631093E-13	2,389058E+05	7,729242E-01	2,638288E+10	3,470792E-03
12	6,846015E+07	1,566482E-13	3,190234E+05	7,748756E-01	3,563579E+10	2,791141E-03
13	8,198862E+07	1,081597E-13	4,052458E+05	7,737116E-01	4,197405E+10	2,269949E-03
14	9,693793E+07	7,540590E-14	4,991668E+05	7,694589E-01	4,696171E+10	1,770595E-03

TIME STEP IS DOUBLED, IHLF= 0, H= 1,00000E+00 SEC, DELT= 2,52419E-02 CM, X= 1,52000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -1, H= 2,00000E+00 SEC, DELT= 1,84573E-01 CM, X= 1,54000E+02 SEC
TIME STEP IS DOUBLED, IHLF= -2, H= 4,00000E+00 SEC, DELT= 1,36563E+00 CM, X= 1,58000E+02 SEC

OUTPUT FROM RKAM2G FOR COLUMN (6, 1) AND TIME = 180,0
KCYC= 14 TIMDEL= 3,700000E-02 TIMTOT= 2,253000E+00 TTX= 1,407300E+01

K	ALTITUDE,CM	DENSITY,G/CM3	VEL.,CM/SEC	DEN, RATIO	INT, E.,ERG/G	PRESS.,D/CM2
1	9,000000E+06	3,048612E-09	0.	1,000000E+00	3,827243E+09	5,833890E+00
2	1,007667E+07	1,396741E-09	6,966558E+03	9,146992E-01	2,746539E+09	1,918102E+00
3	1,129729E+07	8,190903E-10	1,350255E+03	1,058697E+00	2,581144E+09	1,057095E+00
4	1,281730E+07	2,172521E-10	5,518766E+03	9,173059E-01	3,367658E+09	3,658154E-01
5	1,640925E+07	3,391922E-11	2,104692E+04	8,126009E-01	6,375196E+09	1,081208E-01
6	2,094489E+07	1,219165E-11	4,151193E+04	8,168065E-01	1,177865E+10	7,180057E-02
7	2,602553E+07	5,548249E-12	7,050200E+04	8,204615E-01	2,016461E+10	5,593915E-02
8	3,135061E+07	4,332515E-12	1,006412E+05	8,008162E-01	2,277820E+10	4,934344E-02
9	3,684933E+07	3,083176E-12	1,533491E+05	7,796036E-01	2,289660E+10	3,529712E-02
10	4,764261E+07	2,382367E-12	2,049523E+05	7,960659E-01	2,336433E+10	2,783121E-02
11	5,774618E+07	1,776887E-12	2,651344E+05	7,922986E-01	2,419569E+10	2,149651E-02
12	6,933757E+07	1,263179E-12	3,344076E+05	7,889297E-01	2,539021E+10	1,603619E-02
13	8,234589E+07	8,722082E-13	4,110095E+05	7,850753E-01	2,672691E+10	1,165572E-02
14	9,690108E+07	5,559953E-13	4,972227E+05	7,793382E-01	2,927665E+10	8,138839E-03

OUTPUT FROM CHEMEF FOR COLUMN (1, 1) = 1 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,33E+02	3,33E+02	1,84E+04	1,12E+09	3,30E+03	2,27E+11	5,01E+13	1,34E+13	3,99E+06	1,00E+00	1,00E+00	1,69E+00	191,8	191,8
2	4,00E+02	4,00E+02	3,99E+04	6,68E+08	5,99E+03	3,11E+11	2,57E+13	6,81E+12	2,28E+07	1,00E+00	1,00E+00	8,86E-01	194,0	195,2
3	5,34E+02	5,34E+02	1,60E+05	6,12E+08	7,67E+04	4,15E+11	8,12E+12	1,99E+12	2,91E+07	1,00E+00	1,98E+00	3,19E-01	217,1	219,3
4	5,95E+02	5,95E+02	1,78E+05	2,36E+08	8,62E+04	3,01E+11	2,76E+12	5,96E+11	1,09E+08	1,00E+00	1,60E+01	1,24E-01	241,7	245,7
5	6,37E+02	6,37E+02	1,85E+05	1,33E+08	8,64E+04	1,32E+11	8,70E+11	1,69E+11	1,45E+08	1,00E+00	8,42E+01	5,10E-02	306,9	315,0
6	7,42E+02	7,42E+02	1,70E+05	9,72E+07	6,09E+04	4,63E+10	2,69E+11	4,98E+10	1,54E+08	1,00E+00	2,65E+02	2,27E-02	441,0	448,0
7	7,98E+02	7,98E+02	1,51E+05	6,31E+07	4,49E+04	2,24E+10	9,92E+10	1,66E+10	1,41E+08	1,00E+00	8,35E+02	1,13E-02	596,0	588,6
8	6,93E+02	6,93E+02	1,44E+05	3,05E+07	5,60E+04	1,25E+10	4,32E+10	6,59E+09	6,99E+07	1,00E+00	2,86E+03	5,90E-03	706,7	685,0
9	7,72E+02	7,72E+02	1,67E+05	2,31E+07	1,03E+05	6,91E+09	1,83E+10	2,53E+09	5,30E+07	1,41E+00	1,09E+04	3,21E-03	874,0	835,2
10	9,30E+02	9,30E+02	2,61E+05	1,93E+07	8,16E+05	3,60E+09	6,98E+09	8,51E+08	3,41E+07	1,07E+01	9,00E+04	1,60E-03	1087,2	1006,8
11	1,93E+03	1,93E+03	1,28E+06	4,54E+07	7,22E+06	1,75E+09	2,19E+09	1,93E+08	2,74E+07	3,37E+02	1,04E+06	9,80E-04	1813,6	1664,9
12	2,73E+03	2,73E+03	2,91E+06	3,03E+07	7,04E+06	7,21E+08	5,53E+08	3,54E+07	5,15E+06	1,67E+04	2,72E+06	3,79E-04	2135,6	2005,3
13	4,12E+03	4,12E+03	7,76E+06	1,80E+07	2,52E+06	2,44E+08	9,69E+07	2,57E+06	5,53E+05	3,66E+06	4,04E+06	1,57E-04	3140,4	2923,8
14	3,71E+03	3,71E+03	4,96E+06	2,99E+06	6,02E+05	6,52E+07	1,20E+07	4,59E+05	1,64E+05	1,94E+06	3,01E+06	4,15E-05	3517,4	3219,7

OUTPUT FROM CHEMEF FOR COLUMN (2, 1) = 2 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,43E+02	3,43E+02	1,90E+04	1,80E+09	3,42E+03	2,28E+11	5,01E+13	1,34E+13	3,04E+05	1,00E+00	1,00E+00	1,70E+00	193,0	193,0
2	4,49E+02	4,49E+02	4,25E+04	2,59E+09	6,25E+03	3,09E+11	2,52E+13	6,65E+12	7,58E+04	1,00E+00	1,00E+00	8,83E-01	196,9	199,1
3	6,15E+02	6,15E+02	1,73E+05	2,26E+09	7,92E+04	4,16E+11	8,05E+12	1,97E+12	3,35E+05	1,00E+00	2,07E+00	3,40E-01	229,9	235,7
4	6,19E+02	6,19E+02	1,87E+05	2,92E+08	9,13E+04	2,99E+11	2,73E+12	5,89E+11	8,95E+07	1,00E+00	1,69E+01	1,28E-01	242,4	256,1
5	7,45E+02	7,45E+02	1,91E+05	1,73E+08	7,45E+04	1,16E+11	7,43E+11	1,43E+11	1,32E+08	1,00E+00	9,32E+01	4,95E-02	340,2	357,5
6	8,94E+02	8,94E+02	1,55E+05	7,22E+07	4,06E+04	3,61E+10	2,00E+11	3,61E+10	2,21E+08	1,00E+00	2,77E+02	1,90E-02	511,1	505,2
7	8,50E+02	8,50E+02	1,26E+05	4,32E+07	3,18E+04	1,82E+10	7,76E+10	1,26E+10	1,91E+08	1,00E+00	8,22E+02	9,14E-03	649,3	608,5
8	8,19E+02	8,19E+02	1,29E+05	2,94E+07	4,16E+04	1,02E+10	3,43E+10	5,07E+09	1,20E+08	1,00E+00	2,81E+03	4,91E-03	770,8	714,7
9	9,54E+02	9,54E+02	1,52E+05	2,22E+07	7,14E+04	5,56E+09	1,43E+10	1,89E+09	9,59E+07	1,76E+00	9,70E+03	2,61E-03	935,7	863,9
10	1,20E+03	1,20E+03	2,39E+05	2,37E+07	6,24E+05	2,91E+09	5,47E+09	6,23E+08	6,67E+07	1,67E+01	7,31E+04	1,33E-03	1159,5	1058,5
11	3,54E+03	3,54E+03	5,06E+05	7,13E+07	9,56E+06	1,32E+09	1,42E+09	5,51E+07	4,42E+07	1,05E+03	1,93E+05	1,03E-03	2785,8	2531,8
12	4,98E+03	4,98E+03	4,05E+06	5,74E+07	7,00E+06	4,38E+08	2,83E+08	3,87E+06	2,36E+06	2,34E+06	1,53E+06	3,33E-04	3273,2	2970,8
13	5,03E+03	5,03E+03	1,30E+07	2,98E+07	2,53E+06	1,54E+08	4,88E+07	2,68E+05	3,43E+05	8,21E+06	4,78E+06	1,55E-04	4633,5	4201,1
14	4,39E+03	4,39E+03	5,45E+06	3,60E+06	5,89E+05	4,03E+07	6,21E+06	1,89E+05	3,42E+05	2,17E+06	3,28E+06	3,55E-05	4559,8	4066,4

OUTPUT FROM CHEMEF FOR COLUMN (3, 1) = 3 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	3,84E+02	3,84E+02	2,16E+04	7,71E+09	3,72E+03	2,37E+11	5,01E+13	1,34E+13	1,47E+05	1,00E+00	1,00E+00	1,75E+00	199,0	199,0
2	5,47E+02	5,47E+02	5,76E+04	1,10E+10	7,86E+03	3,26E+11	2,26E+13	5,92E+12	1,93E+05	1,00E+00	1,00E+00	8,66E-01	208,2	217,3
3	7,38E+02	7,38E+02	1,87E+05	1,67E+09	7,52E+04	2,86E+11	3,21E+12	7,15E+11	1,60E+06	1,00E+00	9,63E+00	1,62E-01	263,9	278,4
4	9,61E+02	9,61E+02	1,58E+05	8,70E+07	3,82E+04	6,89E+10	4,00E+11	7,37E+10	2,10E+08	1,00E+00	1,18E+02	3,43E-02	460,0	456,5
5	1,01E+03	1,01E+03	1,10E+05	4,55E+06	1,86E+04	2,04E+10	9,55E+10	1,58E+10	5,46E+08	1,00E+00	4,05E+02	1,08E-02	639,1	589,9
6	1,04E+03	1,04E+03	1,01E+05	5,39E+06	1,90E+04	8,82E+09	3,02E+10	4,28E+09	3,56E+08	1,00E+00	1,68E+03	4,34E-03	798,1	719,6
7	1,32E+03	1,32E+03	1,19E+05	4,53E+06	2,56E+04	4,50E+09	1,16E+10	1,39E+09	3,18E+08	1,00E+00	5,47E+03	2,23E-03	1005,2	905,6
8	1,84E+03	1,84E+03	1,71E+05	7,14E+06	4,94E+04	2,80E+09	5,38E+09	4,83E+08	2,67E+08	3,26E+00	1,55E+04	1,55E-03	1360,9	1254,4
9	4,09E+03	4,09E+03	2,58E+05	4,09E+07	5,51E+05	1,65E+09	2,05E+09	2,51E+05	1,11E+08	2,34E+02	2,22E+04	1,39E-03	2790,1	2598,6
10	7,47E+03	7,47E+03	6,07E+05	3,79E+08	2,13E+07	8,20E+08	6,00E+08	1,00E+00	1,74E+07	1,53E+04	2,08E+04	1,22E-03	5311,9	4729,3
11	7,09E+03	7,09E+03	8,45E+05	2,70E+08	2,06E+07	5,17E+08	3,07E+08	1,00E+00	7,76E+06	6,96E+04	5,36E+04	7,37E-04	5420,1	4696,8
12	6,65E+03	6,65E+03	1,55E+06	2,00E+08	2,17E+07	3,37E+08	1,56E+08	1,00E+00	2,89E+06	6,32E+05	2,50E+05	4,77E-04	5391,5	4748,9
13	5,92E+03	5,92E+03	9,33E+06	1,40E+08	2,00E+07	2,03E+08	7,16E+07	1,00E+00	7,76E+05	7,69E+06	1,47E+06	2,86E-04	5060,8	4509,7
14	5,90E+03	5,90E+03	1,12E+07	9,71E+07	1,49E+07	1,49E+08	3,62E+07	2,22E+00	8,22E+05	8,57E+06	2,55E+06	2,28E-04	5677,8	5097,7

OUTPUT FROM CHEMEF FOR COLUMN (4, 1) = 4 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	4,58E+02	4,58E+02	2,66E+04	3,93E+10	4,30E+03	2,62E+11	5,00E+13	1,34E+13	6,55E+05	1,00E+00	1,00E+00	1,92E+00	218,5	218,5
2	6,47E+02	6,47E+02	4,73E+04	4,26E+10	6,35E+03	2,82E+11	2,47E+13	6,55E+12	6,84E+05	1,00E+00	1,00E+00	1,02E+00	225,7	234,1
3	9,25E+02	9,25E+02	1,83E+05	3,16E+09	5,25E+04	2,59E+11	3,61E+12	8,32E+11	3,68E+06	1,00E+00	4,96E+00	2,06E-01	300,0	316,7
4	1,15E+03	1,15E+03	1,48E+05	5,75E+05	2,07E+04	1,03E+11	7,61E+11	1,48E+11	1,91E+08	1,00E+00	2,96E+01	5,99E-02	423,6	428,6
5	1,25E+03	1,25E+03	1,10E+05	1,48E+04	1,45E+04	4,42E+10	2,30E+11	3,90E+10	1,60E+09	1,00E+00	1,04E+02	2,36E-02	572,5	542,9
6	1,30E+03	1,30E+03	9,32E+04	8,45E+03	1,13E+04	2,14E+10	8,80E+10	1,29E+10	2,87E+09	1,00E+00	3,12E+02	1,21E-02	766,8	702,5
7	1,77E+03	1,77E+03	8,72E+04	1,60E+04	8,68E+03	1,06E+10	3,33E+10	8,84E+08	1,41E+09	1,00E+00	1,07E+03	6,66E-03	1192,4	1051,3
8	4,07E+03	4,07E+03	1,33E+05	1,96E+06	2,19E+05	5,23E+09	1,03E+10	4,02E+04	2,29E+08	1,00E+00	1,13E+03	4,33E-03	2295,9	1988,8
9	5,83E+03	5,83E+03	2,67E+05	7,25E+07	3,60E+06	3,20E+09	4,53E+09	3,61E+01	3,41E+07	1,69E+02	1,73E+03	3,33E-03	3486,9	3066,9
10	7,01E+03	7,01E+03	5,71E+05	5,83E+08	1,48E+07	2,23E+09	2,59E+09	1,00E+00	3,29E+06	3,40E+03	2,18E+03	2,66E-03	4005,6	3547,5
11	7,43E+03	7,43E+03	5,25E+05	6,22E+08	1,42E+07	1,69E+09	1,77E+09	1,00E+00	3,70E+06	5,01E+03	2,86E+03	2,19E-03	4358,9	3849,7
12	5,88E+03	5,88E+03	7,62E+05	6,60E+08	1,76E+07	1,11E+09	1,82E+08	1,00E+00	3,37E+06	1,54E+04	2,06E+04	1,67E-03	6970,8	6116,2
13	4,15E+03	4,15E+03	1,70E+06	6,21E+08	4,20E+07	5,84E+08	2,51E+05	1,00E+00	2,33E+04	4,68E+05	4,15E+05	1,27E-03	8468,9	7337,2
14	7,66E+03	7,66E+03	1,69E+08	5,00E+08	9,33E+07	2,76E+08	2,36E+01	1,00E+00	1,00E+00	1,24E+08	4,38E+07	9,94E-04	6771,2	5806,9

OUTPUT FROM CHEMEF FOR COLUMN (5, 1) = 5 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	6,22E+02	6,22E+02	3,71E+04	6,82E+10	5,47E+03	4,96E+11	5,00E+13	1,33E+13	1,40E+08	1,00E+00	1,00E+00	2,97E+00	332,9	332,9
2	7,81E+02	7,81E+02	3,37E+04	2,22E+10	4,04E+03	3,17E+11	2,43E+13	6,40E+12	2,01E+07	1,00E+00	1,00E+00	1,29E+00	296,4	300,8
3	1,07E+03	1,07E+03	6,97E+04	1,05E+07	3,70E+03	2,43E+11	7,55E+12	1,89E+12	1,01E+08	1,00E+00	1,00E+00	4,57E-01	321,4	341,8
4	1,38E+03	1,38E+03	9,78E+04	1,72E+03	2,63E+03	1,38E+11	1,66E+12	3,57E+11	4,95E+09	1,00E+00	2,82E+00	1,23E-01	413,0	410,1
5	1,82E+03	1,82E+03	6,67E+04	2,24E+03	2,27E+03	6,70E+10	3,76E+11	6,25E+10	2,90E+10	1,00E+00	1,72E+01	3,95E-02	581,8	539,9
6	1,97E+03	1,97E+03	6,22E+04	4,65E+03	5,92E+03	4,62E+10	1,89E+11	2,54E+10	3,73E+10	1,00E+00	4,13E+01	2,54E-02	685,7	630,4
7	2,05E+03	2,05E+03	5,43E+04	3,59E+03	6,34E+03	3,00E+10	1,01E+11	1,08E+10	2,90E+10	1,00E+00	8,08E+01	1,62E-02	778,5	706,0
8	2,18E+03	2,18E+03	5,23E+04	2,86E+03	4,03E+03	1,90E+10	5,40E+10	4,41E+09	1,94E+10	1,00E+00	1,61E+02	1,06E-02	908,3	822,4
9	3,26E+03	3,26E+03	5,30E+04	4,36E+00	3,63E+03	1,11E+10	2,50E+10	6,78E+06	3,27E+09	1,00E+00	2,67E+02	7,09E-03	1485,2	1328,1
10	3,47E+03	3,47E+03	1,72E+05	3,84E+07	8,70E+04	5,20E+09	3,03E+07	9,68E+02	1,73E+08	1,65E+01	1,77E+04	4,63E-03	7047,3	6211,8
11	3,78E+03	3,78E+03	9,60E+05	1,25E+07	8,30E+06	2,34E+09	1,48E+04	1,00E+00	4,53E+05	3,78E+04	1,87E+05	3,47E-03	12098,6	10636,6
12	6,51E+03	6,51E+03	6,75E+07	1,04E+09	2,07E+08	1,15E+09	4,00E+00	1,00E+00	1,71E+00	2,75E+07	3,61E+07	2,79E-03	9090,5	8002,1
13	5,46E+03	5,46E+03	5,27E+08	2,58E+09	2,02E+08	6,35E+08	1,45E+00	1,00E+00	1,00E+00	3,02E+08	2,23E+08	2,28E-03	3963,0	3485,9
14	4,27E+03	4,27E+03	8,13E+08	1,55E+09	4,17E+07	3,92E+08	1,09E+00	1,00E+00	1,00E+00	5,18E+08	2,94E+08	1,78E-03	3736,8	3277,9

OUTPUT FROM CHEMEF FOR COLUMN (6, 1) = 6 TDAT1 =150,00 TDAT2 =180,00

K	TEL	TVIBN2	ENE	N(4S)	N(2D)	O	N2	O2	NO	NP	OP	PRES	TEM(1)	TEM(2)
1	8,52E+02	8,52E+02	4,99E+04	3,00E+03	6,71E+03	1,20E+12	5,01E+13	1,29E+13	2,01E+10	1,00E+00	1,00E+00	5,83E+00	657,8	657,8
2	9,46E+02	9,46E+02	3,22E+04	1,46E+03	2,77E+03	5,82E+11	2,29E+13	5,90E+12	2,13E+10	1,00E+00	1,00E+00	1,92E+00	493,2	471,7
3	1,15E+03	1,15E+03	3,91E+04	1,67E+03	2,63E+03	4,11E+11	1,34E+13	3,41E+12	2,61E+10	1,00E+00	1,00E+00	1,06E+00	430,2	442,7
4	1,65E+03	1,65E+03	4,62E+04	3,21E+03	5,40E+03	2,48E+11	3,59E+12	3,78E+11	4,04E+10	1,00E+00	1,00E+00	3,66E-01	650,6	623,1
5	2,33E+03	2,33E+03	5,42E+04	8,44E+03	6,71E+03	1,34E+11	5,94E+11	1,94E+08	6,66E+09	1,00E+00	1,46E+01	1,08E-01	1184,4	1067,7
6	2,88E+03	2,88E+03	8,75E+04	1,89E+05	7,54E+04	9,77E+10	2,37E+11	5,71E+03	7,69E+07	1,00E+00	2,24E+01	7,18E-02	1718,5	1553,2
7	3,37E+03	3,37E+03	2,36E+05	1,85E+06	5,12E+05	7,91E+10	1,17E+11	1,73E+00	1,73E+06	1,00E+00	3,50E+01	5,59E-02	2285,6	2070,3
8	3,60E+03	3,60E+03	3,92E+05	5,00E+06	1,09E+06	6,95E+10	9,07E+10	1,00E+00	4,73E+05	1,00E+00	4,01E+01	4,93E-02	2493,0	2230,9
9	3,82E+03	3,82E+03	3,90E+05	1,14E+07	1,44E+06	5,28E+10	6,35E+10	1,00E+00	1,55E+05	1,00E+00	4,49E+01	3,53E-02	2488,9	2197,6
10	4,06E+03	4,06E+03	3,92E+05	3,20E+07	1,62E+06	4,25E+10	4,77E+10	1,00E+00	4,76E+04	1,00E+00	5,32E+01	2,78E-02	2503,1	2233,3
11	4,35E+03	4,35E+03	4,17E+05	1,26E+08	2,08E+06	3,32E+10	3,45E+10	1,00E+00	6,84E+03	3,66E+00	6,40E+01	2,15E-02	2578,5	2295,1
12	4,71E+03	4,71E+03	5,93E+05	6,81E+08	3,83E+06	2,49E+10	2,04E+10	1,00E+00	1,20E+01	3,46E+01	1,02E+02	1,60E-02	2844,0	2526,1
13	3,20E+03	3,20E+03	2,89E+06	3,59E+09	3,65E+07	1,35E+10	7,72E+06	1,00E+00	1,16E+00	1,54E+03	1,39E+04	1,17E-02	5560,1	4926,5
14	4,94E+03	4,94E+03	3,00E+07	9,82E+09	7,54E+08	5,09E+09	4,63E+01	1,00E+00	1,00E+00	7,30E+05	2,19E+07	8,16E-03	4245,6	3748,0

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